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Inventory of

Federal Energy-Related Environment and Safety Research for FY 1978

Volume I - Executive Summary

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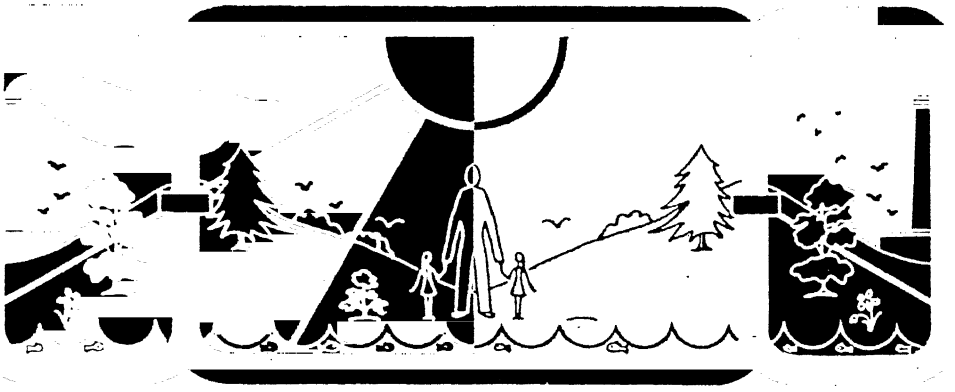

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CAVEAT

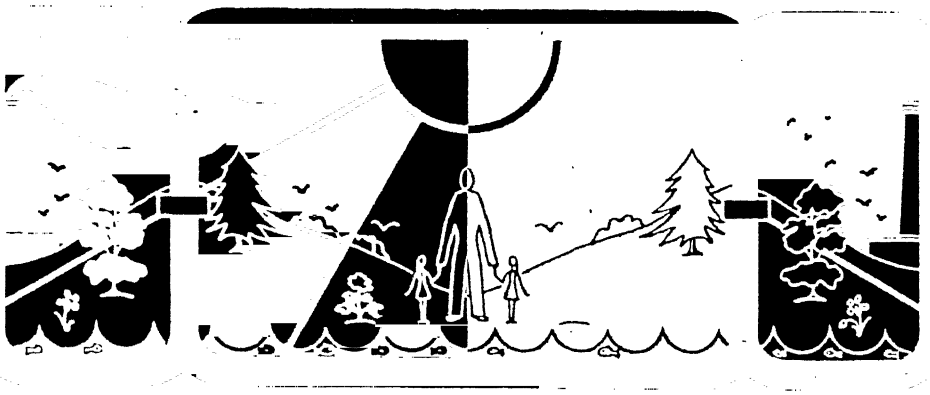
To avoid confusion, the definitions provided in the overview section (p. 5,6) should be referred to when reading the tables and figures in the Executive Summary (i.e., funding agency is distinctly different from monitoring agency.

When the total number of projects in the document differs from the totals in any one table or figure - such as pollutants or area of research - the difference is accounted for by those projects that did not address themselves (in actuality or in reporting) to that topic. These tables and figures were based on the subset of total projects for which this information was available - this often was a substantial difference from the Inventory totals.

The other qualifier to bear in mind is that projects relating to several technologies or areas of research will be counted as a project for each related category total. While this results in "double counting" of project totals, the related dollar amounts have been fractionated to make the dollars "additive".

The on-line data base as now available differs from this printed version in several ways. One important addition to the computerized version is 438 EPA projects (mainly health effects) that were provided too late for the published version.

Finally, this compilation of projects, although unique and containing the majority of Federal Energy Related Environmental R&D is not 100% complete, nor is it uniform in its collection and coverage of each agency.



1. INTRODUCTION*

The FY 1978 Federal Inventory is a compilation of 3225 federally funded energy-related environmental and safety research projects. It consists of three volumes: an executive summary providing an overview of the data (Volume I), a catalog listing each Inventory project followed by series of indexes (Volume II), and an interactive terminal guide giving instructions for on-line data retrieval (Volume III). Volume I reviews the inventory data as a whole and also within each of three major categories: biomedical and environmental research, environmental control technology research, and operational safety research.

Project information was collected from the following federal agencies through use of a questionnaire (see sample Appendix A): Department of Agriculture, Department of Commerce, Department of Defense, Department of Energy, Department of Health, Education, and Welfare, Department of the Interior, Department of Transportation, U.S. Environmental Protection Agency, National Aeronautics and Space Administration, National Science Foundation, Nuclear Regulatory Commission, Tennessee Valley Authority, and U.S. Coast Guard. The principal contacts at these agencies for the information published in this Inventory are listed in Appendix B. A list of agency abbreviations is given in Appendix C. Appendix D is a complete list of the log or responding agencies.

The Inventory resulted from the passage of two Congressional acts — the Energy Reorganization Act of 1974, PL 93-438, and the Federal Non-nuclear Energy Research and Development Act of 1974, PL-93-577. This

* See CAVEAT (p. viii).

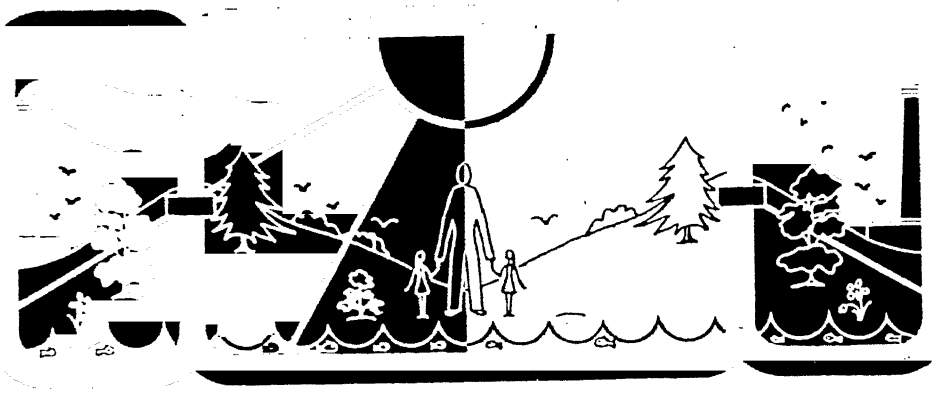
legislation authorized the administrator of the Energy Research and Development Administration (ERDA) to establish programs to evaluate the adverse environmental effects of energy development and utilization, to minimize duplication of effort among federal agencies, and to submit a comprehensive energy research, development, and demonstration plan to Congress on an annual basis. The initial Inventory was published in October 1975 and covered FY 1974 and FY 1975 research. The Inventory is published annually by the Office of the Assistant Secretary for the Environment, Department of Energy. The number of projects, the technical information content, and the number of federal agencies responding have been expanded each year. Also, in this edition the contributing agencies are listed by agency subdivision, where possible, to better define the relationship between project and agency.

As well as providing an overview of current work in energy-related areas of environmental, health, and safety research, the Inventory provides a means for determining general funding levels for research related to specific energy technologies, for relating agency effort to technologies, and for assessing the sufficiency of federally sponsored research where gaps and overlaps occur. This information can be used in planning future research efforts and in locating specific types of research or researchers. Users include federal, state, and local agencies interested in utilizing federal research results or in establishing complementary programs. Both private industry and government agencies use the Inventory to locate experts in specific subject areas.

Users should realize that while the data is relatively complete, the Inventory does not provide total coverage of federal research. Data collection is limited by the ability to locate pertinent projects and the cooperation of the various agencies in supplying appropriate data. A vigorous effort is made each year to identify all relevant federal programs and projects and to improve the accuracy of the data. Pertinent projects may have been excluded for various semantic, mechanical, and/or philosophical reasons. Because technologies and specific research topics (e.g., pollutants) cut across a wide variety of scientific disciplines, it is difficult at times to identify appropriate research for inclusion in the Inventory. Also, because there is no universally accepted definition for

energy-related environmental and safety research, exclusion of appropriate projects and/or the inclusion of less appropriate projects may occur.

In addition to the three printed volumes, access to the computerized data base is available. Data are maintained on the DECsystem-10 computer at Oak Ridge National Laboratory for on-line retrieval using System 1022. Volume III is an instruction manual for using System 1022 to handle the Inventory data. Access to System 1022 can be obtained through Janice Barker, Oak Ridge National Laboratory (615-574-7577, FTS 624-7577). The Inventory is also available on RECON (the Department of Energy on-line retrieval system). Access to RECON can be obtained through Charles Spath, Technical Information Center, Oak Ridge, Tennessee (615-576-1194, FTS 626-1194).



2. OVERVIEW OF INVENTORY DATA *

Volume I of the Inventory consists largely of tables and graphs which summarize data obtained from 14 federal agencies on 3225 projects. A small percentage of the projects was included in the Inventory despite incomplete data provided on the questionnaires, thus affecting the summary data. Because the questionnaire format allowed projects to relate to several technology areas and research categories, the subtotals will not always be additive to the actual total Inventory project number. For example, a project involved in research applied to three energy sources will be counted as one project doing research in each energy source and will therefore be counted three times. However, the total project funding will be additive to total Inventory funding because individual project dollars are divided by the percentage reported in the questionnaire. This applies to technology and research categories.

An understanding of the terms defined below is needed before using the summary tables and graphs which follow:

1. *log or responding agency* — the agency reporting a project for inclusion in the Inventory
2. *monitoring agency* — the agency responsible for direct contact with the principal investigator and the performing organization
3. *funding agency* — the organization providing all or part of the funds for all or part of the project
4. *principal investigator* — the person actually performing the project work or having direct supervisory project responsibility

See CAVEAT (p. viii).

5. *performing organization* — the organization providing the principal investigator with administrative, facility, and/or logistic support
6. *fossil energy source* — the energy source group containing fossil fuels (fossil general, coal, oil, gas, oil shales, and tar sands)
7. *nuclear energy source* — the energy source group containing nuclear fuels (nuclear general, nuclear fission, and nuclear fusion)
8. *multienergy* — the energy source category including projects involved with more than one energy source; the specific energy sources may not be in the same energy source group (e.g., fossil and nuclear or fossil general and oil and gas)

Tables 2.1 and 2.2 show the total number of projects reported by the log agency and the total number of dollars reported by the funding agency respectively. As can be seen from these tables, the Department of Energy has the largest number of projects and the greatest amount of funding for energy-related projects in this Inventory. Over 80% of the projects represent the efforts of four agencies (Department of Energy, U.S. Environmental Protection Agency, Department of Health, Education, and Welfare, and Nuclear Regulatory Commission).

Table 2.3 outlines the relationships among funding agency, energy source involved, and the research category to which the projects apply. The table provides an overview of the major areas of interest by energy source and research category for the various funding agencies and illustrates current research priorities among funding agencies. Again, it should be noted that the number of projects in Table 2.3 may not be additive to the total number of Inventory projects.

A breakdown by pollutants for the entire Inventory is given in Table 2.4. This shows total research dollars for pollutants only, and no attempt is made to associate pollutants with other technical areas in this section. In addition, Table 2.4 provides a breakdown of pollutants for the three research categories — biomedical and environmental research, environmental control technology, and operational safety. Table 2.5 shows the relationship between monitoring agency and energy source.

Figure 2.1 provides a comparison of FY 1976, FY 1977, and FY 1978 percentages of dollars spent on various energy sources. Since the terminology for specific energy sources has changed in the three years, the

energy sources for the years have been grouped under like terminology. Those groups are fossil fuels, nuclear, hydroelectric, geothermal, solar, and conservation.

Figure 2.2 details the level of funding for the entire Inventory based on the type of research activity reported (questionnaire item A). The highest funded activity is applied research, followed by basic research, and then by field studies. The rest of the research activities account for the remainder of total funding.

The relationship between monitoring agency and energy source supported is shown in Fig. 2.3. A clear association can be made between agencies and specific energy sources. The total dollars monitored by each agency is given at the bottom of its respective bar on the graph. A breakdown of total dollars by research category and subcategory is provided in Fig. 2.4. The health effects subcategory received the greatest proportion of funds.

Figure 2.5 relates funding, where applicable, to the environmental background associated with pollutants under study (questionnare item E). The atmospheric and terrestrial environmental areas represent a major portion of expended funds.

Table 2.1. Federal Agency Responses

Responding agency	Total number of projects reported	Number of projects with funds reported	Number of projects with no funds reported
Department of Agriculture[a]	152	0	152
Department of Commerce	60	56	4
Department of Defense	18	18	0
Department of Energy	1210	1127	83
Department of Health, Education, and Welfare	562	300	262
Department of the Interior	83	73	10
Department of Transportation	23	17	6
Federal Energy Administration	3	3	0
National Aeronautics and Space Administration	3	3	0
National Science Foundation	70	46	24
Nuclear Regulatory Commission	312	282	30
Tennessee Valley Authority	133	123	10
U.S. Coast Guard	7	6	1
U.S. Environmental Protection Agency	589	527	62
Total	3225	2581	644

[a]1978 funds were not available.

Table 2.2. Total Reported Funding**

Funding agency	Dollars (in millions)	Number of projects
Bureau of Land Management	5.3	9
Department of Commerce	0.1	2
Department of Defense	3.4	14
Department of Energy	376.0	1112
Department of Health, Education, and Welfare	5.8	26
Department of Labor	0.4	1
Department of the Interior	37.8	59
Department of Transportation	3.8	18
Federal Housing Administration	0.1	1
Fish and Wildlife Service	0.5	10
National Aeronautics and Space Administration	0.1	3
National Bureau of Standards	0.4	2
National Cancer Institute	0.1	1
National Institute for Occupational Safety and Health	0.3	1
National Institute of Environmental Health Sciences	19.8	239
National Institutes of Health	0.8	9
National Oceanographic and Atmospheric Administration	8.0	15
National Science Foundation	11.4	46
Nuclear Regulatory Commission	72.0	289
Tennessee Valley Authority	9.0	94
U.S. Air Force	0.3	5
U.S. Coast Guard	0.7	4
U.S. Environmental Protection Agency	90.9	653
U.S. Geological Service	9.7	6
U.S. Navy	0.1	1
Other government agencies	0.2	1
Other	5.5	23
Total	662.5	2644

**Projects with more than one funding agency are tallied for each agency.

Table 2.3. Distribution of Funding Agency Dollars by Energy Source within Research Categories

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Research category[a]	Dollars (in millions)
Department of Agriculture	Fossil	0	50	ECT	*b*
		0	60	BER	*b*
		0	13	OS	*b*
	Nuclear		2	ECT	*b*
			5	BER	*b*
			2	OS	*b*
	Hydroelectric	0	1	ECT	*b*
			1	BER	*b*
	Solar	0	16	ECT	*b*
			19	BER	*b*
			2	OS	*b*
	Conservation		12	ECT	*b*
			15	BER	*b*
			4	OS	*b*
	Multienergy		24	ECT	*b*
			37	BER	*b*
			7	OS	*b*
Department of Commerce	Fossil	3	0	ECT	1.2
		17	0	BER	9.4
		2	0	OS	1.1
	Nuclear	3	0	OS	0.1
		1	0	BER	0.1
	Multienergy	6	1	BER	0.9
		1	0	ECT	0.2

Table 2.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Research category[a]	Dollars (in millions)
		1	0	OS	0.006
		1	0	NS	0.04
Department of Defense	Fossil	7	0	ECT	0.5
		9	0	BER	0.5
		8	0	OS	0.3
	Hydroelectric	5	0	ECT	0.4
		4	0	BER	0.4
	Conservation	1	0	ECT	0.1
		1	0	BER	0.1
	Multienergy	2	0	BER	1.2
	Other advanced systems	1	0	ECT	0.001
		1	0	BER	0.001
		1	0	OS	0.001
Department of Energy	Fossil	78	27	ECT	10.3
		282	43	BER	37.8
		15	0	OS	0.9
		4	0	NS	1.0
	Nuclear	27	0	ECT	87.4
		194	2	BER	90.6
		18	0	OS	28.2
		5	0	NS	16.6
	Hydroelectric	1	0	BER	1.0

Table 2.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Research category[a]	Dollars (in millions)
	Geothermal	4	0	ECT	0.3
		17	0	BER	3.5
		2	0	OS	0.2
	Solar	8	5	ECT	0.6
		27	1	BER	3.7
		8	1	OS	0.3
	Conservation	9	0	ECT	3.2
		17	0	BER	1.7
		5	0	OS	2.9
		3	0	NS	0.4
	Multienergy	34	0	ECT	2.4
		395	8	BER	66.0
		84	12	OS	1.5
		7	0	NS	0.7
Department of Health, Education, and Welfare	Fossil	2	2	ECT	0.2
		7	92	BER	0.5
			1	NS	
		2	19	OS	0.1
	Nuclear		6	ECT	
			54	BER	
			16	OS	
	Solar		1	ECT	
			1	BER	
	Conservation	2	0	BER	0.1
		2	0	OS	0.1

Table 2.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Research category[a]	Dollars (in millions)
	Multienergy	7	2	ECT	1.0
		18	15	BER	3.4
		7	1	OS	0.5
Department of Health, Education, and Welfare — National Institute of Environmental Health Sciences	Fossil	119	1	BER	9.6
		14	0	OS	1.1
		1	0	NS	0.05
	Nuclear	2	0	BER	0.1
	Hydroelectric	1	0	BER	0.1
	Conservation	1	0	BER	0.04
	Multienergy	1	0	ECT	0.1
		58		BER	5.1
		1	0	OS	0.1
Department of Health, Education, and Welfare — National Institute for Occupational Safety and Health	Multienergy	1	0	BER	0.2
		1	0	OS	0.2
Department of the Interior	Fossil	17	1	ECT	5.9
		34	6	BER	28.1
		22	2	OS	4.2
		2	0	NS	0.2
	Nuclear	1	0	ECT	0.6
		1	0	BER	0.6
		1	0	OS	0.6

Table 2.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Research category[a]	Dollars (in millions)
	Hydroelectric	4	0	ECT	0.1
		8	1	BER	0.1
		4	1	OS	0.04
	Geothermal	2	1	BER	0.3
		1	0	OS	0.3
	Multienergy	3	0	ECT	0.1
		15	1	BER	6.5
		7	0	OS	0.1
Department of Transportation	Fossil	4	1	ECT	0.1
		10	0	BER	0.8
		8	1	OS	0.7
	Nuclear	0	1	ECT	
		1	0	BER	0.03
		1	0	OS	0.03
	Conservation	0	1	BER	
		2	4	OS	0.3
		2	0	NS	0.4
	Multienergy	2	0	ECT	0.3
		2	0	BER	0.3
			1	NS	
National Aeronautics and Space Administration	Multienergy	1	0	BER	0.03

Table 2.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Research category[a]	Dollars (in millions)
National Science Foundation	Fossil	9	4	ECT	0.5
		17	9	BER	5.3
		6	8	OS	0.3
		1	0	NS	0.1
	Nuclear	1	1	BER	0.004
		1	1	OS	0.004
	Solar	0	2	BER	
	Conservation	1	0	BER	0.04
	Multienergy	7	1	ECT	0.2
		14	3	BER	3.5
		4	2	OS	0.1
		2	0	NS	0.1
	Other advanced systems	2	0	NS	0.1
Nuclear Regulatory Commission	Nuclear	78	12	ECT	9.4
		154	17	BER	15.5
		167	13	OS	38.6
		17	2	NS	3.4
	Conservation	1	0	OS	0.03
	Multienergy	11	3	ECT	0.5
		17	3	BER	1.7
		18	3	OS	2.7
		1	2	NS	0.07
		2	0	NS	0.1

Table 2.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Research category[a]	Dollars (in millions)
Tennessee Valley Authority	Fossil	38	12	ECT	2.5
		31	9	BER	2.1
		1		NS	0.03
	Nuclear	6	0	ECT	0.1
		8	0	BER	0.2
		5	0	OS	0.1
	Hydroelectric	1	0	ECT	0.008
		1	0	BER	0.008
		1	0	OS	0.008
	Solar	0	1	NS	
	Other advanced systems	1	0	ECT	0.02
	Conservation	7	0	NS	1.7
	Multienergy	13	1	ECT	0.4
		13	1	BER	0.5
		3	0	OS	0.2
				NS	1.1
U.S. Coast Guard	Fossil	3	0	ECT	0.5
		2	0	BER	0.1
		1	0	OS	0.1
	Solar	1	0	ECT	0.05
U.S. Environmental Protection Agency	Fossil	22	2	ECT	1.9
		190	15	BER	27.2

Table 2.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Research category[a]	Dollars (in millions)
		21	1	OS	1.2
		31	3	NS	6.4
	Nuclear	1	0	ECT	0.02
		10	3	BER	0.9
	Geothermal	5	0	BER	0.5
		3	0	NS	0.1
	Solar	1	0	ECT	0.05
		14	1	BER	0.8
		1	0	OS	0.05
		2	0	NS	0.1
	Conservation	5	0	ECT	0.1
		6	0	BER	0.5
		6	0	OS	0.5
		1	0	NS	0.04
	Multienergy	11	2	ECT	0.9
		147	24	BER	26.0
		13	2	OS	1.2
		9	3	NS	2.8
Other government agencies	Multienergy	1	0	BER	0.2
Other	Fossil	14	1	ECT	1.7
		12	1	BER	2.0
	Conservation	0	1	NS	

Table 2.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Research category[a]	Dollars (in millions)
	Nuclear	1	0	BER	0.01
	Multienergy	1	1	ECT	0.5
		2	1	BER	0.5
		1	0	NS	0.05

[a]BER — biomedical and environmental; ECT — environmental control technology; OS — operational safety; NS — not specified.

[b]1978 funds were not available.

Table 2.4. Distribution of Reported Funding by Pollutant [b]

Pollutant	Dollars (in millions) [a]			
	Total	Biomedical and environmental research	Environmental control technology research	Operational safety research
Agricultural wastes	1.1	0.9	0.3	0.1
Carbon oxides	12.0	10.7	1.8	1.0
Dissolved solids/salinity	8.3	7.7	5.4	4.1
Heat/thermal	19.0	13.0	8.6	6.4
Heavy metals	52.0	49.9	6.8	24.4
Hydrocarbons	37.8	35.1	8.6	5.8
Microbiological agents	8.6	8.4	0.2	0.1
Nitrates	8.2	7.9	1.8	0.9
Nitrogen oxides	11.9	10.6	2.0	1.2
Noise/vibration	2.5	2.0	0.4	1.1
Nutrients	6.3	6.2	1.1	0.3
Odor	1.3	1.2	0.6	0.2
Organics (excluding hydrocarbons)	20.2	16.3	6.1	4.9
Other	36.1	32.0	3.9	2.4
Other noxious gases	22.6	22.0	1.5	18.0
Particulates/dust	28.2	22.5	7.0	4.7
Pesticides/herbicides	4.2	4.0	0.4	0.3
Photochemical oxidants	5.5	5.3	0.6	0.3
Radiation, ionizing (nuclear)	235.6	113.4	102.3	60.5
Radiation, nonionizing (infrared, microwave)	5.1	5.0	0.2	0.7
Sludge/sediments	8.1	6.9	4.9	3.1
Sulfates	13.5	12.9	4.2	1.3
Sulfur oxides	17.6	16.2	3.9	1.5
olids	12.0	11.7	2.4	0.8
	1.4	1.3	0.4	0.2
	3.0	2.8	0.4	0.3
		4.7	2.7	0.9
		430.6	178.8	145.5

e fractionated by number of pollutants
fractionated by categories.

llutants checked are not included on

Table 2.5. Monitoring Agency Funding by Energy Source

Monitoring agency	Fossil	Nuclear	Hydroelectric	Geothermal	Solar	Conservation	Multienergy	Other advanced system	Total
Department of Commerce	2.1	0.2			0.005		1.24		3.545
Department of Defense	1.5		0.7			0.3	0.04	0.04	2.58
Department of Energy	51.1	203.94	0.1	3.9	4.7	8.2	84.0		355.94
Department of Health, Education, and Welfare	1.2						4.1		5.3
Department of Health, Education, and Welfare — National Institute of Environmental Health Sciences	11.0	0.1	0.1			0.04	6.3		17.54
Department of Health, Education, and Welfare — National Institute for Occupational Safety and Health	0.9				0.1	0.5	2.0		3.5
Department of the Interior	50.71	1.8	0.3	0.6			8.1		61.51
Department of Transportation	1.5	0.1				0.7			2.3
National Aeronautics and Space Administration							0.1		0.1
National Science Foundation	6.4	0.009				0.04	5.1	0.1	11.649
Nuclear Regulatory Commission		67.0				0.03	3.8		70.83
Tennessee Valley Authority	4.6	0.3	0.3			1.7	1.8	0.02	8.45
U.S. Coast Guard	1.0				0.05		0.6		1.65
U.S. Environmental Protection Agency	33.3	0.9		0.6	0.8	0.8	29.0		65.4
Other	1.3								1.3
Total	166.61	274.349	1.23	5.1	5.655	12.31	146.18	0.16	611.594

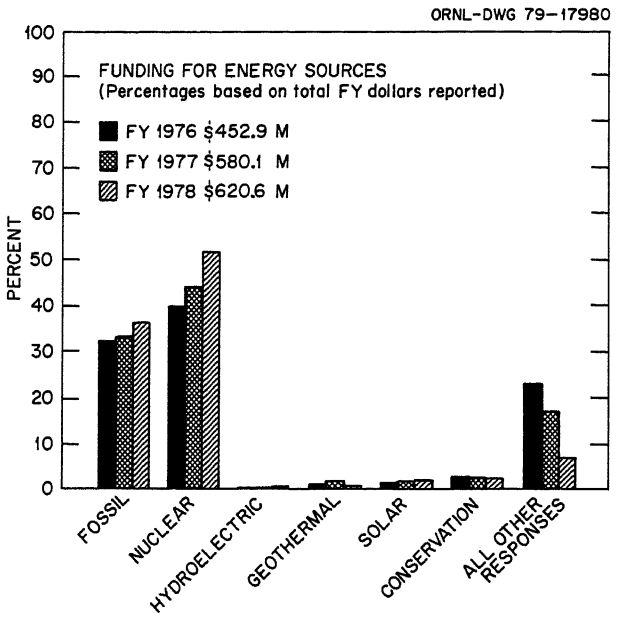


Fig. 2.1. Comparison of FY 1976, FY 1977, and FY 1978 percentages of funding for energy sources.

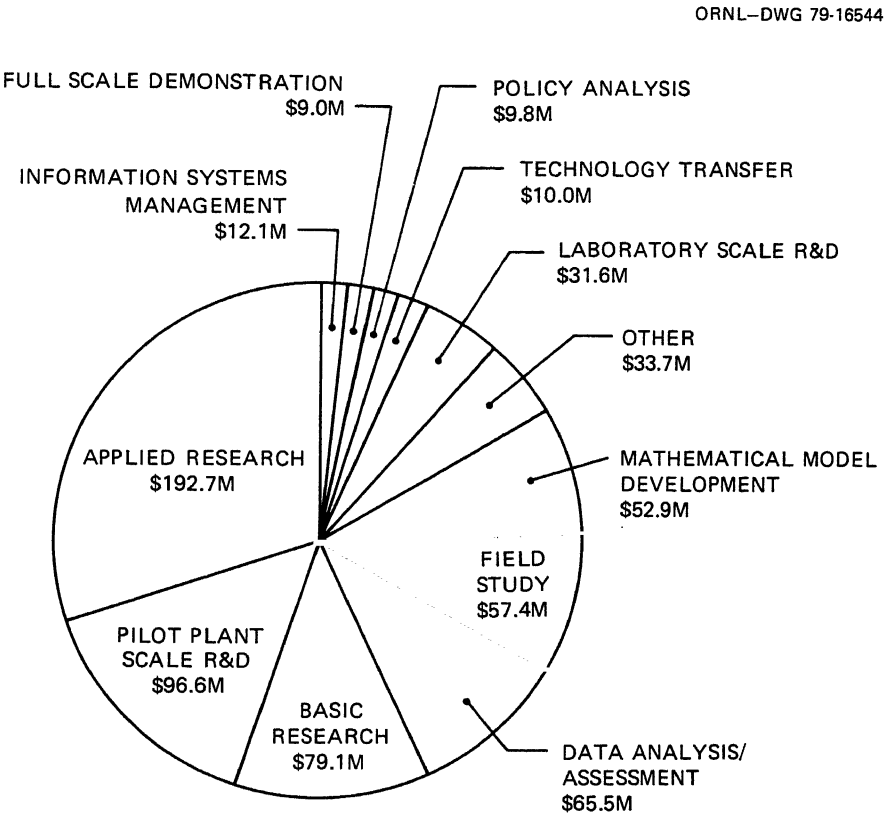


Fig. 2.2. Distribution of reported funds by type of activity.

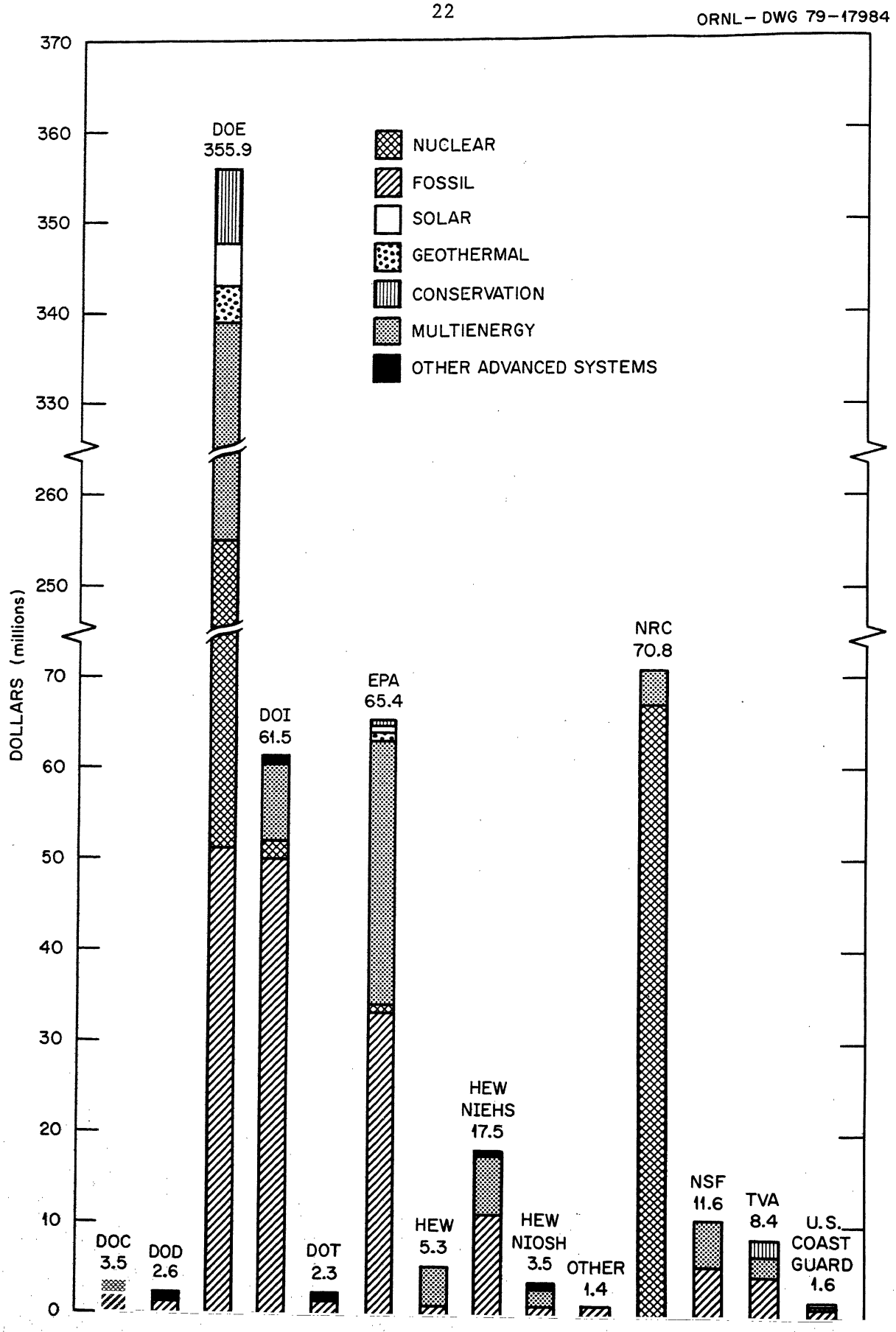


Fig. 2.3. Monitoring agency funding by energy source.

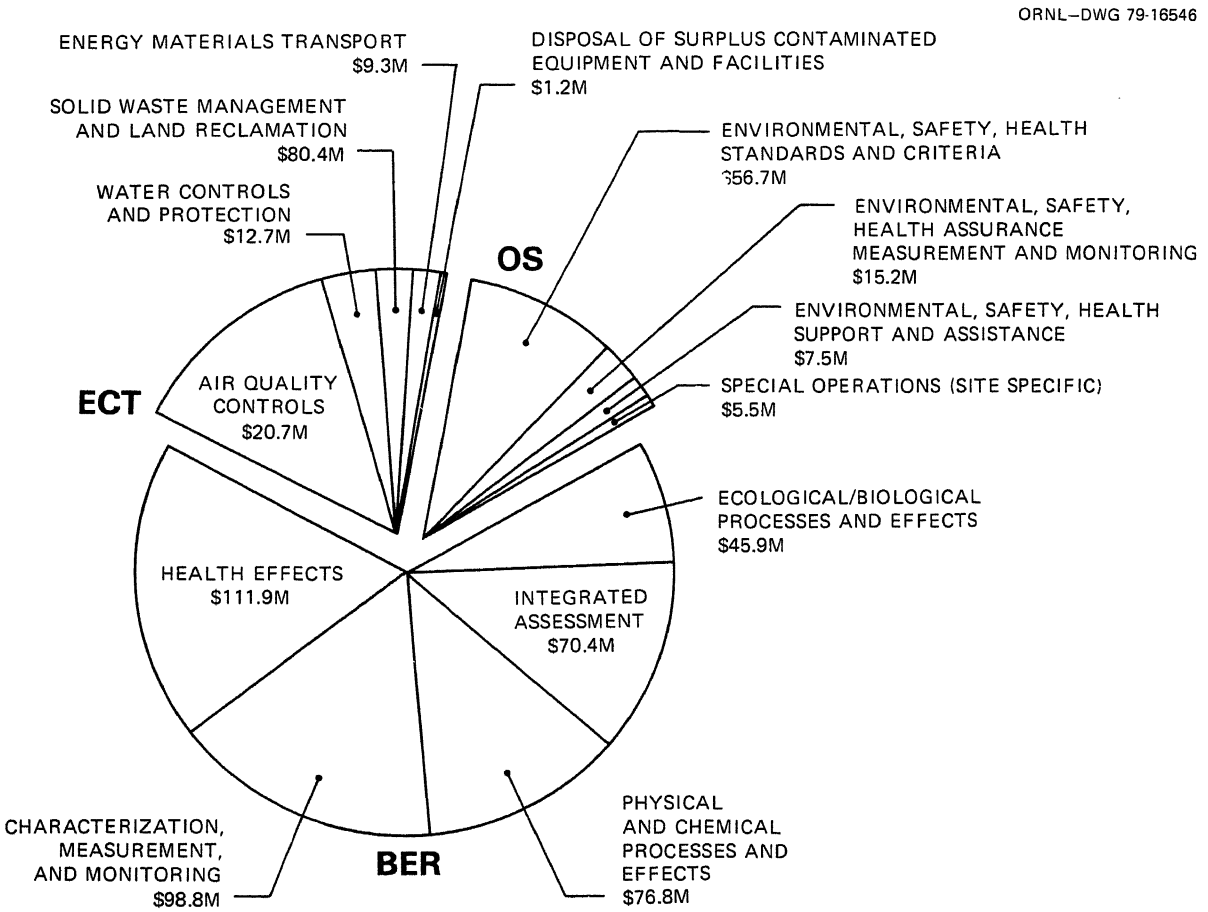


Fig. 2.4. Distribution of funding by research category.

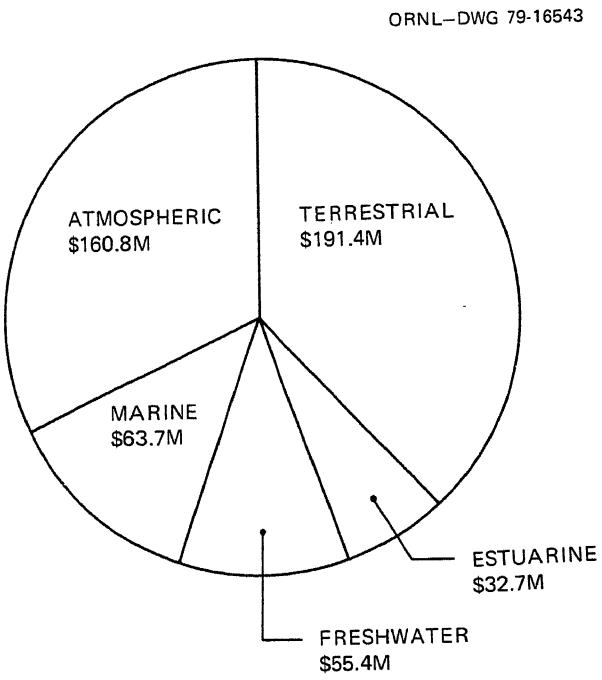
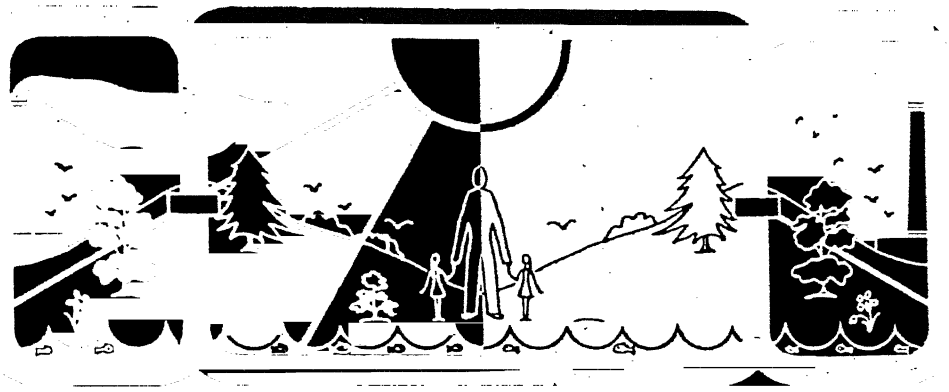


Fig. 2.5. Distribution of funding by environmental background.



3. BIOMEDICAL AND ENVIRONMENTAL RESEARCH SUMMARY *

This section provides an overview of research projects applicable entirely or in part to biomedical and environmental research. This category is further divided into five subcategories: (1) characterization, measurement, and monitoring; (2) physical and chemical processes and effects; (3) integrated assessment; (4) health effects; and (5) ecological/biological processes and effects. Each of these subcategories has been further delineated with respect to objective, as indicated in the questionnaire (Appendix A).

Tables 3.1, 3.2, and 3.3 and Figs. 3.1, 3.2, and 3.3 parallel those in Sect. 2. They provide the following summary data for biomedical and environmental research:

- number of projects
- total funding dollars
- relationships among funding agencies, energy source, and biomedical and environmental research subcategory
- funding breakdown by type of research activity
- relationship between monitoring agency and energy source
- comparison of FY 1976, FY 1977, and FY 1978 expenditures by energy source

Three additional tables provide a more detailed picture of the relationship between energy source and biomedical and environmental research funding. Table 3.4 relates the major research subcategories to individual energy sources with a funding total for each relationship. Table 3.5

*See CAVEAT (p. viii).

gives the funding relationship between funding agency and biomedical and environmental research subcategory. See Table 2.4 for the distribution of funds that was reported for each pollutant in the biomedical and environmental research category.

Table 3.1. Federal Agency Responses — Biomedical and Environmental Research Projects

Responding agency	Total number of projects	Number of projects with funds reported	Number of projects with no funds reported
Department of Agriculture[a]	140	0	140
Department of Commerce	59	55	4
Department of Defense	16	16	0
Department of Energy	1059	992	67
Department of Health, Education, and Welfare	558	299	259
Department of the Interior	68	59	9
Department of Transportation	13	12	1
Federal Energy Administration	3	3	0
National Aeronautics and Space Administration	3	3	0
National Science Foundation	60	40	20
Nuclear Regulatory Commission	189	168	21
Tennessee Valley Authority	84	78	6
U.S. Coast Guard	4	4	0
U.S. Environmental Protection Agency	487	436	51
Total	2743	2165	578

[a]1978 funds were not available.

Table 3.2. Reported Funding for Biomedical and Environmental Research

Funding agency	Dollars (in millions)	Number of projects
Bureau of Land Management	5.3	9
Department of Defense	3.3	12
Department of Energy	259.1	977
Department of Health, Education, and Welfare	5.8	26
Department of Labor	0.4	1
Department of the Interior	36.5	46
Department of Transportation	2.2	13
Federal Housing Administration	0.1	1
Fish and Wildlife Service	0.4	9
National Aeronautics and Space Administration	0.1	3
National Bureau of Standards	0.3	2
National Cancer Institute	0.1	1
National Institute for Occupational Safety and Health	0.3	1
National Institute of Environmental Health Sciences	19.5	231
National Institutes of Health	0.8	9
National Oceanographic and Atmospheric Administration	8.0	15
National Science Foundation	11.1	40
Nuclear Regulatory Commission	29.1	174
Tennessee Valley Authority	5.2	53
U.S. Air Force	0.3	5
U.S. Coast Guard	0.3	2
U.S. Environmental Protection Agency	78.1	556
U.S. Geological Service	9.7	6
U.S. Navy	0.1	1
Other government agencies	0.2	1
Other	5.36	19
Total	481.7	2213

Table 3.3. Distribution of Funding Agency Dollars for Biomedical and Environmental Research by Energy Source

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Biomedical and environmental research category	Dollars (in millions)
Department of Agriculture	Fossil	0	33	Characterization, measurement, and monitoring	
			48	Physical and chemical processes and effects	
			27	Integrated assessment	
			47	Ecological/biological processes and effects	
			4	Health effects	
	Nuclear		5	Characterization, measurement, and monitoring	
			4	Physical and chemical processes and effects	
			2	Integrated assessment	
			5	Ecological/biological processes and effects	
	Hydroelectric		1	Physical and chemical processes and effects	
			1	Ecological/biological processes and effects	
			1	Health effects	
	Solar		9	Characterization, measurement, and monitoring	
			10	Physical and chemical processes and effects	
			5	Integrated assessment	
			11	Ecological/biological processes and effects	
			1	Health effects	
	Conservation		5	Characterization, measurement, and monitoring	
			7	Physical and chemical processes and effects	
			4	Integrated assessment	

Table 3.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Biomedical and environmental research category	Dollars (in millions)
			11	Ecological/biological processes and effects	
			1	Health effects	
	Multienergy		19	Characterization, measurement, and monitoring	
			16	Physical and chemical processes and effects	
			14	Integrated assessment	
			25	Ecological/biological processes and effects	
			1	Health effects	
Department of Commerce	Fossil	13	0	Characterization, measurement, and monitoring	5.1
		3	0	Physical and chemical processes and effects	1.3
		6	0	Integrated assessment	2.0
		8	0	Ecological/biological processes and effects	1.8
		2	0	Health effects	1.5
	Nuclear	1	0	Characterization, measurement, and monitoring	0.2
	Solar	1	0	Characterization, measurement, and monitoring	0.005
	Multienergy	3	1	Characterization, measurement, and monitoring	0.007
		3	0	Physical and chemical processes and effects	0.2
		3	0	Integrated assessment	0.7
		4	0	Ecological/biological processes and effects	0.2

Table 3.3 (continued)

gency	Energy source	Number of projects with funding	Number of projects without funding	Biomedical and environmental research category	Dollars (in millions)
)efense	Fossil	9	0	Characterization, measurement, and monitoring	1.1
		4	0	Physical and chemical processes and effects	0.1
		2	0	Integrated assessment	1.0
		5	0	Ecological/biological processes and effects	0.2
		4	0	Health effects	0.2
	Hydroelectric	2	0	Integrated assessment	0.1
		4	0	Ecological/biological processes and effects	0.6
	Conservation	1	0	Characterization, measurement, and monitoring	0.3
	Other advanced systems	1	0	Characterization, measurement, and monitoring	0.04
	Multienergy	1	0	Characterization, measurement, and monitoring	1.2
Department of Energy	Fossil	118	28	Characterization, measurement, and monitoring	16.1
		71	11	Physical and chemical processes and effects	5.4
		27	6	Integrated assessment	2.0
		82	5	Ecological/biological processes and effects	6.2
		97	2	Health effects	11.6
	Nuclear	68	0	Characterization, measurement, and monitoring	60.0
		49	0	Physical and chemical processes and effects	11.2
		15	1	Integrated assessment	7.3

Table 3.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Biomedical and environmental research category	Dollars (in millions)
		41	0	Ecological/biological processes and effects	21.5
		92	1	Health effects	24.1
	Hydroelectric	1	0	Characterization, measurement, and monitoring	0.05
		1	0	Ecological/biological processes and effects	0.05
	Geothermal	6	0	Characterization, measurement, and monitoring	1.0
		7	0	Physical and chemical processes and effects	0.8
		4	0	Integrated assessment	1.3
		3	0	Ecological/biological processes and effects	0.3
		1	0	Health effects	0.2
	Solar	16	1	Characterization, measurement, and monitoring	1.3
		9	0	Physical and chemical processes and effects	0.7
		9	0	Integrated assessment	0.6
		15	0	Ecological/biological processes and effects	1.7
		3	0	Health effects	0.2
	Conservation	7	0	Characterization, measurement, and monitoring	1.7
		1	0	Integrated assessment	0.04
		9	0	Health effects	0.9
	Multienergy	141	2	Characterization, measurement, and monitoring	16.2
		83	1	Physical and chemical processes and effects	8.0
		94	1	Integrated assessment	15.0

Table 3.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Biomedical and environmental research category	Dollars (in millions)
		107	3	Ecological/biological processes and effects	8.8
		118	2	Health effects	20.1
Department of Health, Education, and Welfare	Fossil	6	1	Characterization, measurement, and monitoring	0.4
		3	3	Physical and chemical processes and effects	0.1
		2	1	Integrated assessment	0.1
		3	9	Ecological/biological processes and effects	0.1
		4	89	Health effects	0.1
	Nuclear	0	16	Characterization, measurement, and monitoring	
		0	4	Physical and chemical processes and effects	
			3	Integrated assessment	
			15	Ecological/biological processes and effects	
			45	Health effects	
	Solar		1	Physical and chemical processes and effects	
			1	Health effects	
	Conservation	2	0	Characterization, measurement, and monitoring	0.2
	Multienergy	16	2	Characterization, measurement, and monitoring	1.8
		9	2	Physical and chemical processes and effects	0.4
		7	1	Integrated assessment	0.6
		11	3	Ecological/biological processes and effects	0.9
		12	15	Health effects	1.1

Table 3.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Biomedical and environmental research category	Dollars (in millions)
Department of Health, Education, and Welfare — National Institute of Environmental Health Sciences	Fossil	7	0	Characterization, measurement, and monitoring	0.1
		4	0	Physical and chemical processes and effects	0.02
		5	0	Integrated assessment	0.02
		6	0	Ecological/biological processes and effects	0.1
		117	1	Health effects	10.5
	Nuclear	1	0	Characterization, measurement, and monitoring	0.02
		1	0	Integrated assessment	0.03
		1	0	Health effects	0.03
	Hydroelectric	1	0	Health effects	0.1
	Conservation	1	0	Health effects	0.04
	Multienergy	11	0	Characterization, measurement, and monitoring	0.3
		8	0	Physical and chemical processes and effects	0.2
		11	0	Integrated assessment	0.6
		15	0	Ecological/biological processes and effects	0.5
		57	0	Health effects	3.9
Department of Health, Education, and Welfare — National Institute for Occupational Safety and Health	Multienergy	1	0	Characterization, measurement, and monitoring	0.3
Department of the Interior	Fossil	27	6	Characterization, measurement, and monitoring	18.3
		7	1	Physical and chemical processes and effects	4.2

Table 3.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Biomedical and environmental research category	Dollars (in millions)
		13	1	Integrated assessment	5.9
		13	1	Ecological/biological processes and effects	4.6
		2	0	Health effects	3.9
	Nuclear	1	0	Characterization, measurement, and monitoring	1.8
	Hydroelectric	8	1	Characterization, measurement, and monitoring	0.1
		4	1	Physical and chemical processes and effects	0.04
		5	1	Ecological/biological processes and effects	0.1
	Geothermal	2	1	Characterization, measurement, and monitoring	0.6
		0	1	Physical and chemical processes and effects	
		0	1	Integrated assessment	
		0	1	Ecological/biological processes and effects	
	Multienergy	10	0	Characterization, measurement, and monitoring	3.2
		8	0	Physical and chemical processes and effects	0.1
		11	1	Integrated assessment	3.1
		8	0	Ecological/biological processes and effects	0.1
		1	0	Health effects	0.3
Department of Transportation	Fossil	7	0	Characterization, measurement, and monitoring	0.4
		1	0	Integrated assessment	0.1
		2	0	Health effects	1.0

Table 3.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Biomedical and environmental research category	Dollars (in millions)
	Nuclear	1	0	Physical and chemical processes and effects	0.1
	Conservation	0	1	Characterization, measurement, and monitoring	
	Multienergy	2	0	Physical and chemical processes and effects	0.6
National Aeronautics and Space Administration	Multienergy	1	0	Health effects	0.03
National Science Foundation	Fossil	12	6	Characterization, measurement, and monitoring	1.2
		12	4	Physical and chemical processes and effects	1.5
		7	3	Integrated assessment	1.1
		12	2	Ecological/biological processes and effects	1.4
		4	1	Health effects	0.9
	Nuclear	1	1	Characterization, measurement, and monitoring	0.009
	Solar	0	1	Characterization, measurement, and monitoring	
		0	1	Physical and chemical processes and effects	
			2	Ecological/biological processes and effects	
	Conservation	1	0	Physical and chemical processes and effects	0.04
	Multienergy	9	1	Characterization, measurement, and monitoring	3.4
		4	1	Physical and chemical processes and effects	0.1

Table 3.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Biomedical and environmental research category	Dollars (in millions)
		5	1	Integrated assessment	0.2
		3	0	Ecological/biological processes and effects	0.1
		2	1	Health effects	0.05
Nuclear Regulatory Commission	Nuclear	112	14	Characterization, measurement, and monitoring	17.5
		48	2	Physical and chemical processes and effects	3.0
		31	4	Integrated assessment	1.6
		38	5	Ecological/biological processes and effects	1.6
		30	3	Health effects	2.5
	Multienergy	10	1	Characterization, measurement, and monitoring	0.7
		4	1	Physical and chemical processes and effects	0.2
		9	1	Integrated assessment	1.1
		8	1	Ecological/biological processes and effects	0.3
		8	1	Health effects	0.7
Tennessee Valley Authority	Fossil	23	9	Characterization, measurement, and monitoring	3.2
		5	0	Physical and chemical processes and effects	0.4
		4	0	Ecological/biological processes and effects	0.1
	Nuclear	8	0	Characterization, measurement, and monitoring	0.3
		1	0	Ecological/biological processes and effects	0.001
	Hydroelectric	1	0	Characterization, measurement, and monitoring	0.03

Table 3.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Biomedical and environmental research category	Dollars (in millions)
	Multienergy	9	1	Characterization, measurement, and monitoring	0.3
		2	0	Physical and chemical processes and effects	0.02
		2	0	Integrated assessment	0.8
		4	0	Ecological/biological processes and effects	0.05
		2	0	Health effects	0.02
U.S. Coast Guard	Fossil	2	0	Characterization, measurement, and monitoring	0.3
U.S. Environmental Protection Agency	Fossil	74	7	Characterization, measurement, and monitoring	10.5
		76	2	Physical and chemical processes and effects	8.9
		52	1	Integrated assessment	4.3
		26	0	Ecological/biological processes and effects	1.8
		57	6	Health effects	4.4
	Nuclear	4	1	Characterization, measurement, and monitoring	0.2
		6	0	Physical and chemical processes and effects	0.2
		3	0	Integrated assessment	0.1
		2	0	Ecological/biological processes and effects	0.02
		5	2	Health effects	0.5
	Geothermal	4	0	Characterization, measurement, and monitoring	0.4
		1	0	Physical and chemical processes and effects	0.03
		1	0	Integrated assessment	0.03
		1	0	Health effects	0.03

Table 3.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Biomedical and environmental research category	Dollars (in millions)
	Solar	3	0	Characterization, measurement, and monitoring	0.1
		4	1	Physical and chemical processes and effects	0.1
		11	1	Integrated assessment	0.2
		1	0	Ecological/biological processes and effects	0.05
		15	1	Health effects	0.3
	Conservation	6	0	Characterization, measurement, and monitoring	0.8
		1	0	Physical and chemical processes and effects	0.01
		5	0	Ecological/biological processes and effects	0.1
		5	0	Health effects	0.1
	Multienergy	75	11	Characterization, measurement, and monitoring	11.9
		35	7	Physical and chemical processes and effects	1.8
		48	11	Integrated assessment	10.0
		13	1	Ecological/biological processes and effects	0.7
		44	7	Health effects	3.7
Other government agencies	Multienergy	1	0	Integrated assessment	0.2
Other	Fossil	11	1	Characterization, measurement, and monitoring	3.6
	Nuclear	1	0	Characterization, measurement, and monitoring	0.1
	Multienergy	2	1	Characterization, measurement, and monitoring	1.0

Table 3.4. Biomedical and Environmental Research Funding by Energy Source (dollars in millions)

Energy source	Physical and chemical processes and effects	Integrated assessment	Characterization, measurement, and monitoring	Health effects	Ecological/ biological processes and effects	Total
Fossil fuels (general)	10.92	4.0	15.84	25.1	7.3	63.16
Coal	7.7	9.9	32.3	9.8	3.9	63.6
Oil and gas	8.73	13.71	25.13	10.0	9.89	67.46
Oil shales and tar sands	0.9	0.7	7.3	2.1	0.9	11.9
Nuclear fuels (general)	4.8	7.6	9.02	13.6	2.7	37.72
Nuclear fission	12.8	7.4	77.7	24.9	13.2	136.0
Nuclear fusion	0.2	0.2	0.8	0.7	1.0	2.9
Hydroelectric	0.1	0.2	0.3	0.4	0.8	1.8
Geothermal	1.0	1.4	2.2	0.5	0.5	5.6
Solar	0.1	0.7	0.8	1.0	0.7	3.3
Ocean thermal	0.8	0.3	3.2	0.002	0.9	5.202
Biomass	0.3	0.3	0.3	0.1	1.4	2.4
Wind	0.002	0.1	0.2	0.1	0.1	0.502
Conservation	0.4	0.8	3.2	1.2	0.3	5.9
Other advanced systems	0.02	0.02	0.3	0.1	0.2	0.64
Multienergy	2.5	12.5	13.9	5.5	2.3	36.7
Total	51.272	59.83	192.49	95.102	46.09	444.784

Table 3.5. Distribution of Funding Agency Dollars by Biomedical and Environmental Research Categories

Funding agency	Biomedical and environmental research category	Dollars (in millions)
Department of Commerce	Characterization, measurement, and monitoring	1.5
	Physical and chemical processes and effects	1.5
	Integrated assessment	2.4
	Health effects	1.4
	Ecological/biological processes and effects	1.5
Department of Energy	Characterization, measurement, and monitoring	51.9
	Physical and chemical processes and effects	37.2
	Integrated assessment	25.6
	Health effects	65.9
	Ecological/biological processes and effects	41.6
Department of Health, Education, and Welfare — National Institute of Environmental Health Sciences	Characterization, measurement, and monitoring	0.5
	Physical and chemical processes and effects	0.2
	Integrated assessment	0.7
	Health effects	15.8
	Ecological/biological processes and effects	0.7
Department of the Interior	Characterization, measurement, and monitoring	12.3
	Physical and chemical processes and effects	9.6
	Integrated assessment	13.8
	Health effects	4.3
	Ecological/biological processes and effects	4.9
Department of Transportation	Characterization, measurement, and monitoring	0.1
	Physical and chemical processes and effects	0.5
	Integrated assessment	0.2
	Health effects	0.5
National Institutes of Health	Characterization, measurement, and monitoring	0.2
	Integrated assessment	0.01
	Health effects	0.5
	Ecological/biological processes and effects	0.01

Table 3.5 (continued)

Funding agency	Biomedical and environmental research category	Dollars (in millions)
National Science Foundation	Characterization, measurement, and monitoring	2.6
	Physical and chemical processes and effects	2.8
	Integrated assessment	2.1
	Health effects	0.9
	Ecological/biological processes and effects	2.0
Nuclear Regulatory Commission	Characterization, measurement, and monitoring	10.4
	Physical and chemical processes and effects	3.3
	Integrated assessment	2.3
	Health effects	2.7
	Ecological/biological processes and effects	1.9
Tennessee Valley Authority	Characterization, measurement, and monitoring	1.9
	Physical and chemical processes and effects	0.5
	Integrated assessment	0.3
	Health effects	0.01
	Ecological/biological processes and effects	0.1
U.S. Environmental Protection Agency	Characterization, measurement, and monitoring	13.7
	Physical and chemical processes and effects	19.8
	Integrated assessment	20.9
	Health effects	18.5
	Ecological/biological processes and effects	2.2
Other	Characterization, measurement, and monitoring	5.0
	Physical and chemical processes and effects	1.5
	Integrated assessment	2.3
	Health effects	2.1
	Ecological/biological processes and effects	1.2

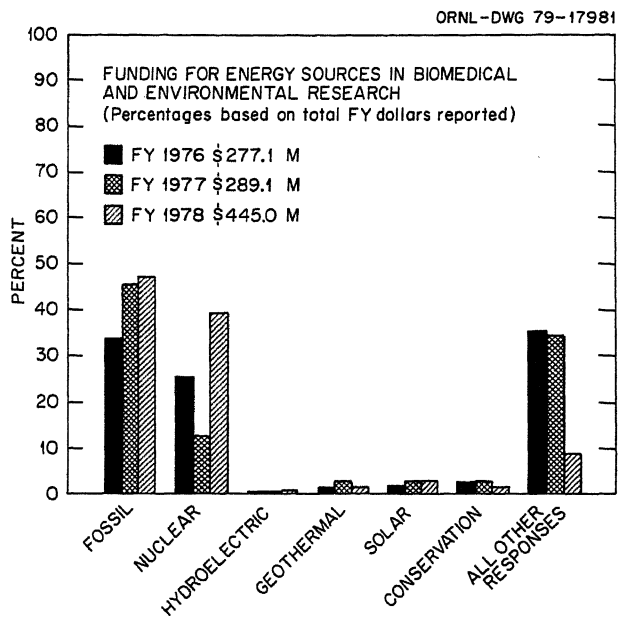


Fig. 3.1. Comparison of FY 1976, FY 1977, and FY 1978 percentages of funding for energy sources in biomedical and environmental research.

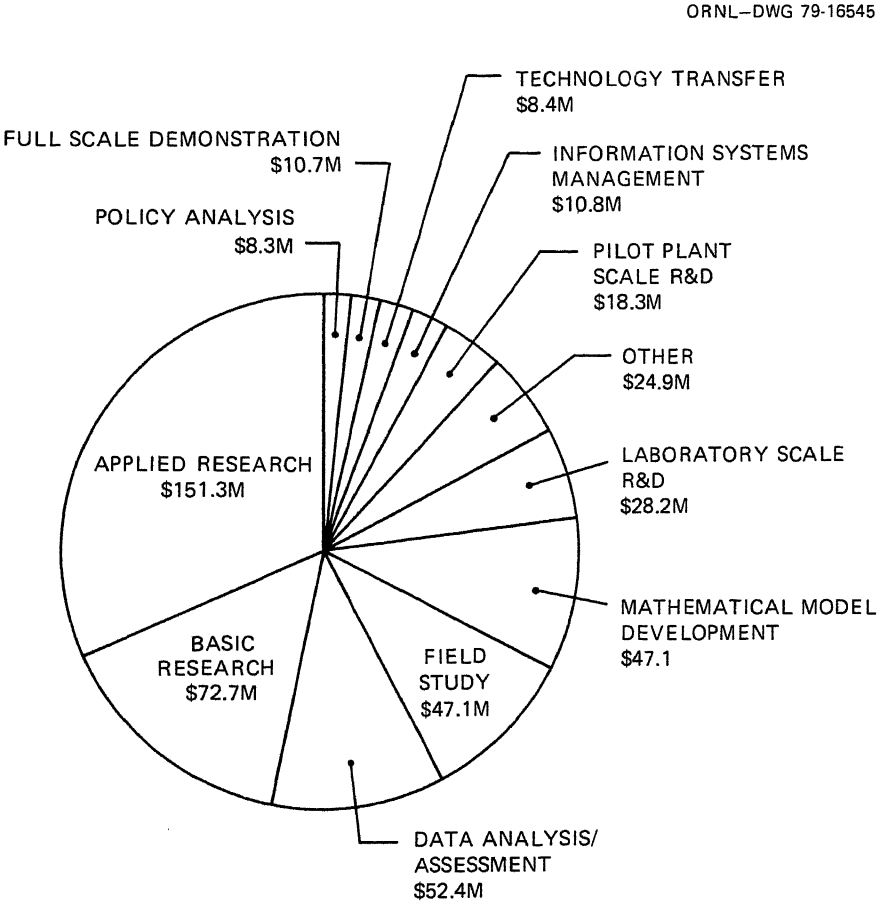


Fig. 3.2. Distribution of funding by type of activity in biomedical and environmental research.

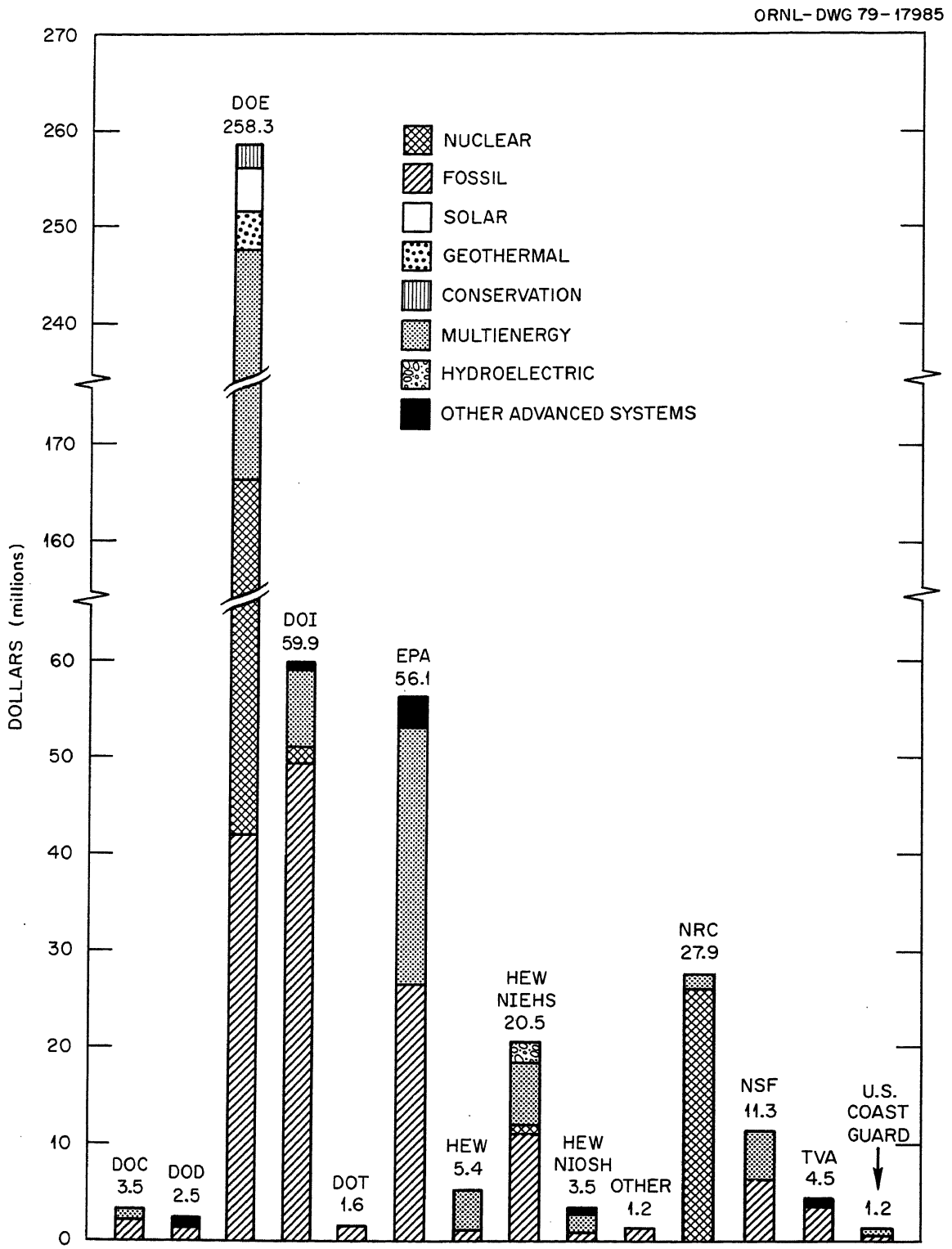
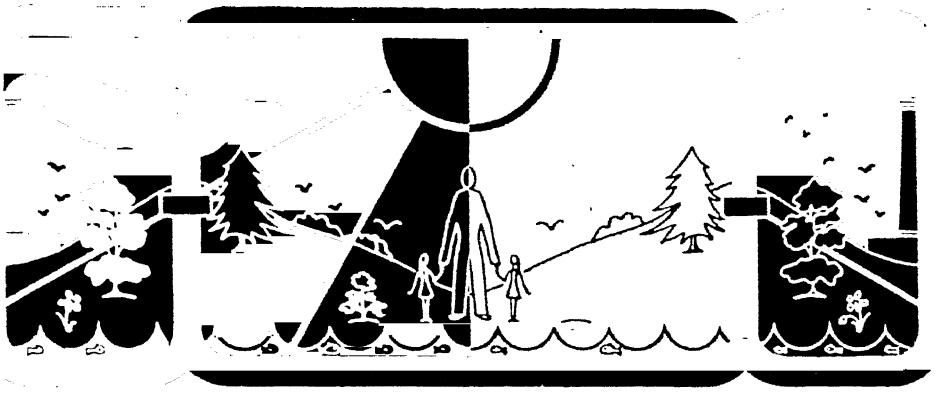


Fig. 3.3. Monitoring agency funding by energy source for biomedical and environmental research.



4. ENVIRONMENTAL CONTROL TECHNOLOGY RESEARCH SUMMARY *

This section provides summary tables and figures for those projects designated wholly or partially as environmental control technology research. The sample questionnaire (Appendix A) describes the environmental control technology subcategories — air quality controls, solid waste management and land reclamation, water control and protection, disposal of surplus contaminated equipment and facilities, and energy materials transport. Tables and figures in this section generally correspond to those in the preceding sections. Funding by pollutants is found in Table 2.4.

*See CAVEAT (p. viii).

Table 4.1. Federal Agency Responses — Environmental Control Technology Research Projects

Responding agency	Total number of projects	Number of projects with funds reported	Number of projects with no funds reported
Department of Agriculture[a]	107	0	107
Department of Commerce	11	11	0
Department of Defense	16	16	0
Department of Energy	182	154	28
Department of Health, Education, and Welfare	33	19	14
Department of the Interior	26	25	1
Department of Transportation	5	4	1
Federal Energy Administration	3	3	0
National Science Foundation	21	16	5
Nuclear Regulatory Commission	102	87	15
Tennessee Valley Authority	85	79	6
U.S. Coast Guard	7	6	1
U.S. Environmental Protection Agency	6	6	0
Total	604	426	178

[a]1978 funds were not available.

Table 4.2. Reported Funding for Environmental Control Technology Research

Funding agency	Dollars (in millions)	Number of projects
Bureau of Land Management	3.4	2
Department of Commerce	0.1	1
Department of Defense	2.1	11
Department of Energy	122.3	162
Department of Health, Education, and Welfare	2.8	9
Department of the Interior	8.0	18
Department of Transportation	0.8	6
Fish and Wildlife Service	0.2	3
National Institute of Environmental Health Sciences	0.4	1
National Institutes of Health	0.1	1
National Oceanographic and Atmospheric Administration	0.4	1
National Science Foundation	1.8	16
Nuclear Regulatory Commission	20.4	89
Tennessee Valley Authority	5.3	59
U.S. Air Force	0.3	5
U.S. Coast Guard	0.7	4
U.S. Environmental Protection Agency	6.7	42
U.S. Geological Service	9.1	4
U.S. Navy	0.1	1
Other	4.5	16
Total	189.5	451

Table 4.3. Distribution of Funding Agency Dollars for Environmental Control Technology Research by Energy Source

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Environmental control technology research category	Dollars (in millions)
Department of Agriculture	Fossil	0	12	Air quality controls	*a*
		0	29	Solid waste management and land reclamation	*a*
		0	15	Water control and protection	*a*
	Nuclear	0	2	Water control and protection	*a*
	Hydroelectric		1	Water control and protection	*a*
	Solar		1	Air quality controls	*a*
			15	Solid waste management and land reclamation	*a*
			2	Water control and protection	*a*
	Conservation	0	1	Air quality controls	*a*
		0	6	Solid waste management and land reclamation	*a*
			5	Water control and protection	*a*
			2	Energy materials transport	*a*
	Multienergy		2	Air quality controls	*a*
			11	Solid waste management and land reclamation	*a*
			10	Water control and protection	*a*
			2	Energy materials transport	*a*
Department of Commerce	Fossil	1	0	Water control and protection	0.2
		3	0	Energy materials transport	0.4
	Multienergy	1	0	Water control and protection	0.04
		1	0	Energy materials transport	0.04
Department of Defense	Fossil	7	0	Air quality controls	0.1
		3	0	Solid waste management and land reclamation	0.1
		4	0	Water control and protection	0.1
		2	0	Energy materials transport	0.1

Table 4.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Environmental control technology research category	Dollars (in millions)
	Hydroelectric	5	0	Water control and protection	0.4
	Conservation	1	0	Water control and protection	0.1
	Other advanced systems	1	0	Air quality controls	0.002
		1	0	Water control and protection	0.002
		1	0	Disposal of surplus contaminated equipment and facilities	0.002
		1	0	Energy materials transport	0.002
Department of Energy	Fossil	32	13	Air quality controls	1.9
		18	5	Solid waste managment and land reclamation	1.1
		49	14	Water control and protection	3.4
		1	0	Disposal of surplus contaminated equipment and facilities	0.02
		18	3	Energy materials transport	2.6
	Nuclear	9	0	Air quality controls	6.8
		6	0	Solid waste management and land reclamation	75.2
		6	0	Water control and protection	1.6
		4	0	Disposal of surplus contaminated equipment and facilities	0.4
		10	0	Energy materials transport	1.9
	Geothermal	3	0	Air quality controls	0.1
		2	0	Solid waste management and land reclamation	0.04
		3	0	Water control and protection	0.1
		2	0	Energy materials transport	0.01
	Solar	2	0	Air quality controls	0.1

Table 4.3 (continued)

ding agency	Energy source	Number of projects with funding	Number of projects without funding	Environmental control technology research category	Dollars (in millions)
		1	0	Solid waste management and land reclamation	0.007
		6	0	Water control and protection	0.2
		1	0	Energy materials transport	0.02
	Conservation	7	0	Air quality controls	2.9
		2	0	Water control and protection	0.1
		1	0	Energy materials transport	0.1
	Multienergy	16	0	Air quality controls	0.5
		5	0	Solid waste management and land reclamation	0.04
		16	0	Water control and protection	0.6
		4	0	Disposal of surplus contaminated equipment and facilities	0.04
		10	0	Energy materials transport	0.3
Department of Health, Education, and Welfare	Fossil	2	1	Air quality controls	0.2
		0	1	Disposal of surplus contaminated equipment and facilities	
	Nuclear	0	3	Air quality controls	
			3	Disposal of surplus contaminated equipment and facilities	
	Solar	0	1	Air quality controls	
	Multienergy	7	1	Air quality controls	0.7
		3	0	Solid waste management and land reclamation	0.001
		1	1	Disposal of surplus contaminated equipment and facilities	0.001
		0	1	Energy materials transport	

Table 4.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Environmental control technology research category	Dollars (in millions)
Department of Health, Education, and Welfare — National Institute of Environmental Health Sciences	Multienergy	1	0	Air quality controls	0.1
Department of the Interior	Fossil	3	0	Air quality controls	0.1
		7	0	Solid waste management and land reclamation	0.2
		10	0	Water control and protection	1.7
		9	1	Energy materials transport	0.9
	Nuclear	1	0	Solid waste management and land reclamation	0.2
		1	0	Water control and protection	0.1
		1	0	Disposal of surplus contaminated equipment and facilities	0.1
	Hydroelectric	3	0	Water control and protection	0.05
		1	0	Energy materials transport	0.009
	Multienergy	2	0	Solid waste management and land reclamation	0.1
		1	0	Water control and protection	0.08
Department of Transportation	Fossil	4	0	Air quality controls	0.04
	Nuclear		1	Energy materials transport	
	Multienergy	2	0	Air quality controls	0.3
National Science Foundation	Fossil	8	2	Air quality controls	0.2
		2	0	Solid waste management and land reclamation	0.1
		2	0	Water control and protection	0.1
			2	Energy materials transport	0.03

Table 4.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Environmental control technology research category	Dollars (in millions)
	Multienergy	6	1	Air quality controls	0.1
				Solid waste management and land reclamation	0.02
			1	Water control and protection	
		1	0	Disposal of surplus contaminated equipment and facilities	0.01
Nuclear Regulatory Commission	Nuclear	18	0	Air quality controls	3.5
		28	10	Solid waste management and land reclamation	1.9
		24	0	Water control and protection	1.0
		18	8	Disposal of surplus contaminated equipment and facilities	0.3
		21	3	Energy materials transport	1.2
	Multienergy	5	1	Air quality controls	0.1
			1	Solid waste management and land reclamation	
		4	2	Water control and protection	0.1
		1	0	Disposal of surplus contaminated equipment and facilities	0.004
		3	0	Energy materials transport	0.1
Tennessee Valley Authority	Fossil	20	8	Air quality controls	1.3
		11	4	Solid waste management and land reclamation	0.6
		11	0	Water control and protection	0.7
	Nuclear	1	0	Solid waste management and land reclamation	0.007
		4	0	Water control and protection	0.1

Table 4.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Environmental control technology research category	Dollars (in millions)
		1	0	Disposal of surplus contaminated equipment and facilities	0.001
		1	0	Energy materials transport	0.001
	Hydroelectric	1	0	Water control and protection	0.005
	Other advanced systems	1	0	Solid waste management and land reclamation	0.002
	Multienergy	3	0	Air quality controls	0.04
		2	0	Solid waste management and land reclamation	0.03
		7	1	Water control and protection	0.3
		1	0	Disposal of surplus contaminated equipment and facilities	
U.S. Environmental Protection Agency	Fossil	6	2	Air quality controls	0.2
		4	1	Solid waste management and land reclamation	0.1
		11	0	Water control and protection	0.6
		5	0	Energy materials transport	0.2
	Nuclear	1	0	Water control and protection	0.001
	Solar	1	0	Air quality controls	0.03
	Conservation	5	0	Air quality controls	0.1
		1	0	Solid waste management and land reclamation	0.001
		1	0	Water control and protection	0.006
	Multienergy	5	2	Air quality controls	0.3
		2	0	Solid waste management and land reclamation	0.1
		7	0	Water control and protection	0.2

Table 4.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Environmental control technology research category	Dollars (in millions)
		1	0	Disposal of surplus contaminated equipment and facilities	0.001
		2	0	Energy materials transport	0.1
U.S. Coast Guard	Fossil	3	0	Energy materials transport	0.5
	Solar	1	0	Water control and protection	0.05
Other	Fossil	7	1	Air quality controls	1.0
		5	0	Solid waste management and land reclamation	0.5
		1	0	Energy materials transport	0.1
		1	0	Water control and protection	0.003
	Multienergy	1	1	Water control and protection	0.5

[a]1978 funds were not available.

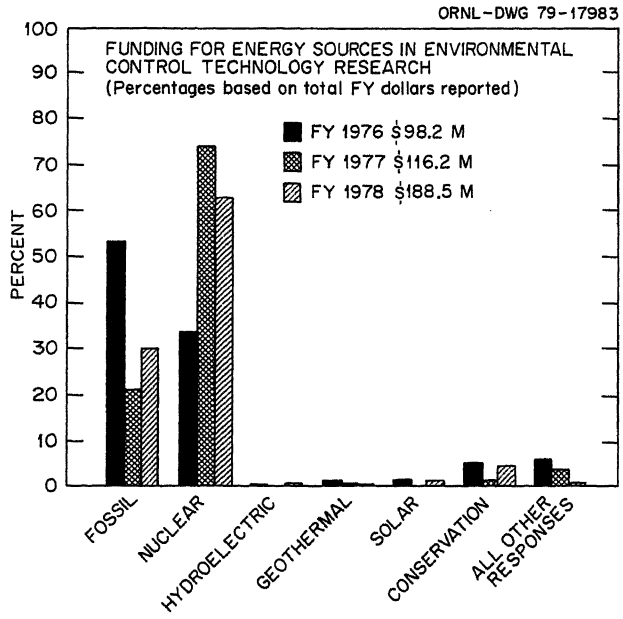


Fig. 4.1. Comparison of FY 1976, FY 1977, and FY 1978 percentages of funding for energy sources in environmental control technology research.

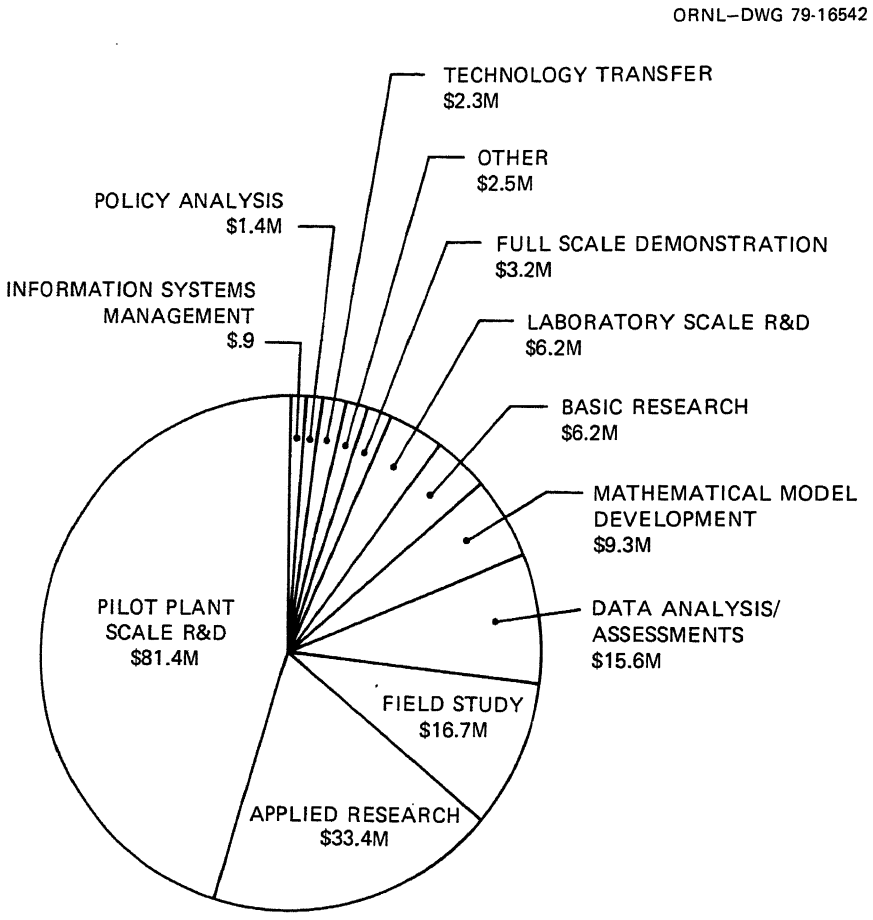


Fig. 4.2. Distribution of funding by type of activity in environmental control technology research.

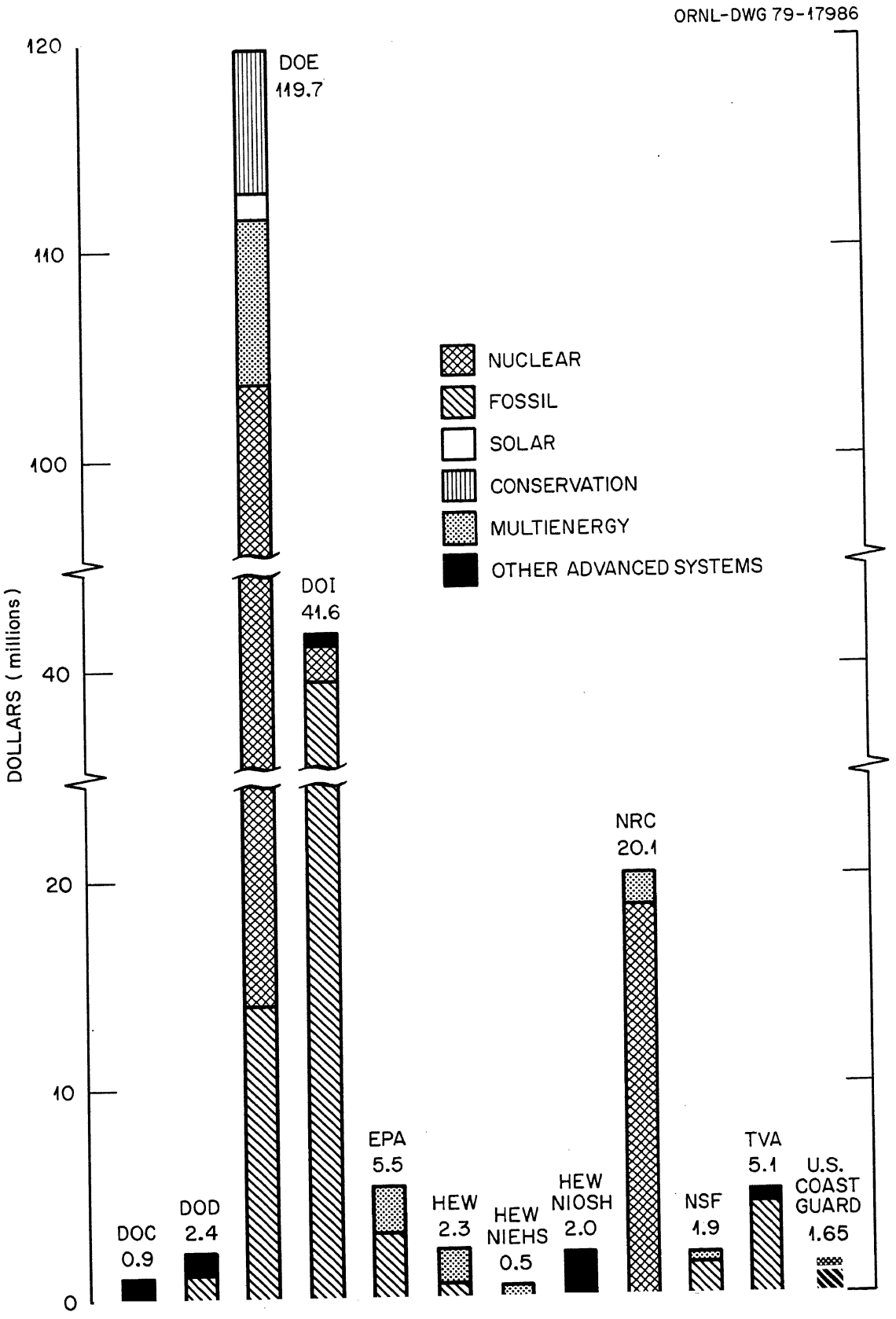
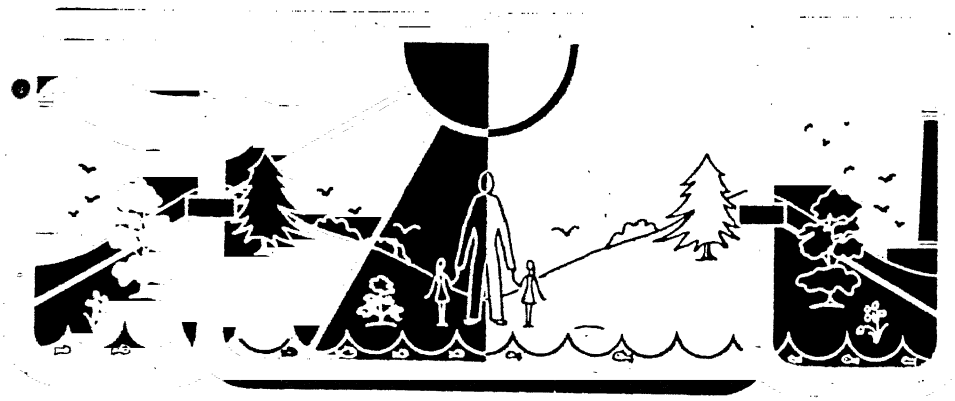


Fig. 4.3. Monitoring agency funding by energy source in environmental control technology research.



5. OPERATIONAL SAFETY RESEARCH SUMMARY*

Summary tables and figures are presented in this section for those projects designated applicable, wholly or partially, to operational safety research. Subcategories of operational safety research are environmental, safety, health assurance measurement and monitoring; environmental, safety, health standards and criteria; environmental, safety, health support and assistance; and special operations. Tables and figures in this section generally correspond to those of preceding sections. Funding by pollutants is given in Table 2.4.

*See CAVEAT (p. viii).

Table 5.1. Federal Agency Responses — Operational Safety Research Projects

Responding agency	Total number of projects	Number of projects with funds reported	Number of projects with no funds reported
Department of Agriculture[a]	29	0	29
Department of Commerce	22	19	3
Department of Defense	9	9	0
Department of Energy	82	69	13
Department of Health, Education, and Welfare	96	54	42
Department of the Interior	39	36	3
Department of Transportation	18	13	5
National Science Foundation	27	11	16
Nuclear Regulatory Commission	200	184	16
Tennessee Valley Authority	14	14	0
U.S. Coast Guard	2	1	1
U.S. Environmental Protection Agency	6	6	0
Total	544	416	128

[a]1978 funds were not available.

Table 5.2. Reported Funding for Operational Safety Research

Funding agency	Dollars (in millions)	Number of projects
Bureau of Land Management	3.8	3
Department of Defense	0.7	4
Department of Energy	70.6	72
Department of Health, Education, and Welfare	1.3	9
Department of the Interior	6.2	27
Department of Transportation	2.8	12
Federal Housing Administration	0.1	1
Fish and Wildlife Service	0.1	5
National Bureau of Standards	0.3	2
National Cancer Institute	0.1	1
National Institute for Occupational Safety and Health	0.3	1
National Institute of Environmental Health Sciences	3.2	22
National Institutes of Health	0.5	4
National Science Foundation	1.1	11
Nuclear Regulatory Commission	55.3	189
Tennessee Valley Authority	0.8	9
U.S. Air Force	0.3	5
U.S. Coast Guard	0.2	1
U.S. Environmental Protection Agency	6.9	46
U.S. Geological Service	7.1	3
U.S. Navy	0.1	2
Total	161.8	429

Table 5.3. Distribution of Funding Agency Dollars for Operational Safety Research by Energy Source

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Operational safety research category	Dollars (in millions)
Department of Agriculture	Fossil	0	6	Environmental, safety, health assurance measurement and monitoring	*a*
			3	Environmental, safety, health standards and criteria	*a*
		0	4	Special operations (site-specific)	*a*
	Nuclear	0	2	Environmental, safety, health assurance measurement and monitoring	*a*
			1	Special operations (site-specific)	*a*
	Solar		1	Environmental, safety, health standards and criteria	*a*
			1	Special operations (site-specific)	*a*
	Conservation		1	Environmental, safety, health assurance measurement and monitoring	*a*
			1	Environmental, safety, health standards and criteria	*a*
			2	Environmental, safety, health support and assistance	*a*
	Multienergy		2	Environmental, safety, health assurance measurement and monitoring	*a*
			3	Environmental, safety, health standards and criteria	*a*
			1	Environmental, safety, health support and assistance	*a*
			1	Special operations (site-specific)	*a*
Department of Commerce	Fossil	2	0	Environmental, safety, health assurance measurement and monitoring	0.3
		1	0	Environmental, safety, health standards and criteria	0.2

Table 5.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Operational safety research category	Dollars (in millions)
		1	0	Environmental, safety, health support and assistance	0.2
		1	0	Special operations (site-specific)	0.2
	Nuclear	1	0	Environmental, safety, health assurance measurement and monitoring	0.1
Department of Defense	Fossil	4	0	Environmental, safety, health assurance measurement and monitoring	0.02
		2	0	Environmental, safety, health standards and criteria	0.1
		6	0	Special operations (site-specific)	0.1
	Other advanced systems	1	0	Environmental, safety, health assurance measurement and monitoring	0.005
		1	0	Environmental, safety, health standards and criteria	0.002
		1	0	Environmental, safety, health support and assistance	0.002
Department of Energy	Fossil	10	6	Environmental, safety, health assurance measurement and monitoring	0.1
		3	4	Environmental, safety, health standards and criteria	0.01
		4	3	Environmental, safety, health support and assistance	0.2
		5	1	Special operations (site-specific)	0.2
	Nuclear	7	0	Environmental, safety, health assurance measurement and monitoring	0.8
		8	0	Environmental, safety, health standards and criteria	27.1

Table 5.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Operational safety research category	Dollars (in millions)
		4	0	Environmental, safety, health support and assistance	0.1
		1	0	Special operations (site-specific)	0.02
	Geothermal	1	0	Environmental, safety, health assurance measurement and monitoring	0.04
		1	0	Environmental, safety, health standards and criteria	0.1
	Solar	3	0	Environmental, safety, health assurance measurement and monitoring	0.04
		4	0	Environmental, safety, health standards and criteria	0.1
		3	0	Environmental, safety, health support and assistance	0.04
		2	1	Special operations (site-specific)	0.04
	Conservation	2	0	Environmental, safety, health assurance measurement and monitoring	0.1
		4	0	Environmental, safety, health standards and criteria	2.6
		1	0	Special operations (site-specific)	0.01
	Multienergy	7	0	Environmental, safety, health assurance measurement and monitoring	0.1
		12	1	Environmental, safety, health standards and criteria	0.4
		6	0	Environmental, safety, health support and assistance	0.5
		2	0	Special operations (site-specific)	0.05
Department of Health, Education, and Welfare	Fossil	2	3	Environmental, safety, health assurance measurement and monitoring	0.1

Table 5.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Operational safety research category	Dollars (in millions)
			2	Environmental, safety, health standards and criteria	
			15	Environmental, safety, health support and assistance	
	Nuclear		1	Environmental, safety, health assurance measurement and monitoring	
			13	Environmental, safety, health standards and criteria	
			3	Environmental, safety, health support and assistance	
	Conservation	2	0	Environmental, safety, health assurance measurement and monitoring	0.1
	Multienergy	8	0	Environmental, safety, health assurance measurement and monitoring	0.3
		3	0	Environmental, safety, health standards and criteria	0.03
		0	1	Environmental, safety, health support and assistance	
Department of Health, Education, and Welfare — National Institute of Environmental Health Sciences	Fossil	1	0	Environmental, safety, health assurance measurement and monitoring	0.003
		13	0	Environmental, safety, health support and assistance	1.1
	Multienergy	1	0	Environmental, safety, health assurance measurement and monitoring	0.1

Table 5.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Operational safety research category	Dollars (in millions)
Department of Health, Education, and Welfare — National Institute for Occupational Safety and Health	Multienergy	1	0	Environmental, safety, health assurance measurement and monitoring	0.2
Department of the Interior	Fossil	12	1	Environmental, safety, health assurance measurement and monitoring	1.1
		5	0	Environmental, safety, health standards and criteria	0.5
		6	0	Environmental, safety, health support and assistance	0.4
		6	1	Special operations (site-specific)	1.2
	Nuclear	1	0	Environmental, safety, health assurance measurement and monitoring	0.4
	Geothermal	1	0	Environmental, safety, health assurance measurement and monitoring	0.1
	Hydroelectric	3	1	Environmental, safety, health assurance measurement and monitoring	0.006
		4	1	Special operations (site-specific)	0.002
	Multienergy	6	0	Environmental, safety, health assurance measurement and monitoring	0.03
		1	0	Environmental, safety, health standards and criteria	0.008
		5	0	Environmental, safety, health support and assistance	0.008
		1	0	Special operations (site-specific)	0.1

Table 5.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Operational safety research category	Dollars (in millions)
Department of Transportation	Fossil	2	0	Environmental, safety, health assurance measurement and monitoring	0.02
		2	1	Environmental, safety, health standards and criteria	0.02
		2	0	Environmental, safety, health support and assistance	0.1
		3	1	Special operations (site-specific)	0.5
	Nuclear	0	1	Environmental, safety, health assurance measurement and monitoring	
		1	0	Environmental, safety, health support and assistance	0.03
	Conservation		2	Environmental, safety, health standards and criteria	
			1	Environmental, safety, health support and assistance	
		2	1	Special operations (site-specific)	0.3
National Science Foundation	Fossil	4	7	Environmental, safety, health assurance measurement and monitoring	0.1
		2	1	Environmental, safety, health standards and criteria	0.01
		1	0	Environmental, safety, health support and assistance	0.004
		1	1	Special operations (site-specific)	0.01
	Nuclear	1	0	Environmental, safety, health assurance measurement and monitoring	0.004
			1	Environmental, safety, health standards and criteria	

Table 5.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Operational safety research category	Dollars (in millions)
	Multienergy	2	2	Environmental, safety, health assurance measurement and monitoring	0.03
		2	1	Environmental, safety, health standards and criteria	0.03
			1	Environmental, safety, health support and assistance	
		1	0	Special operations (site-specific)	0.007
Nuclear Regulatory Commission	Nuclear	19	1	Environmental, safety, health assurance measurement and monitoring	8.0
		113	7	Environmental, safety, health standards and criteria	24.3
		40	4	Environmental, safety, health support and assistance	4.4
		13	2	Special operations (site-specific)	0.9
	Conservation	1	0	Environmental, safety, health support and assistance	0.03
	Multienergy	10	2	Environmental, safety, health assurance measurement and monitoring	1.2
		12	1	Environmental, safety, health standards and criteria	0.3
		4	0	Environmental, safety, health support and assistance	0.05
		2	0	Special operations (site-specific)	0.9
Tennessee Valley Authority	Nuclear	2	0	Environmental, safety, health assurance measurement and monitoring	0.03
		2	0	Environmental, safety, health standards and criteria	0.02
		1	0	Environmental, safety, health support and assistance	0.01

Table 5.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Operational safety research category	Dollars (in millions)
	Hydroelectric	1	0	Environmental, safety, health standards and criteria	0.005
	Multienergy	2	0	Environmental, safety, health assurance measurement, and monitoring	0.01
		1	0	Environmental, safety, health standards and criteria	0.2
U.S. Coast Guard	Fossil	1	0	Environmental, safety, health assurance measurement and monitoring	0.02
U.S. Environmental Protection Agency	Fossil	12	1	Environmental, safety, health assurance measurement and monitoring	0.2
		12	0	Environmental, safety, health standards and criteria	0.3
		5	0	Environmental, safety, health support and assistance	0.2
		1	0	Special operations (site-specific)	0.005
	Solar	1	0	Environmental, safety, health support and assistance	0.03
	Conservation	2	0	Environmental, safety, health assurance measurement and monitoring	0.4
		3	0	Environmental, safety, health standards and criteria	0.03
		3	0	Environmental, safety, health support and assistance	0.04
		1	0	Special operations (site-specific)	0.001
	Multienergy	12	2	Environmental, safety, health assurance measurement and monitoring	0.5

Table 5.3 (continued)

Funding agency	Energy source	Number of projects with funding	Number of projects without funding	Operational safety research category	Dollars (in millions)
		7	0	Environmental, safety, health standards and criteria	0.1
		2	0	Environmental, safety, health support and assistance	0.008
		1	0	Special operations (site-specific)	0.001

[a]1978 funds were not available.

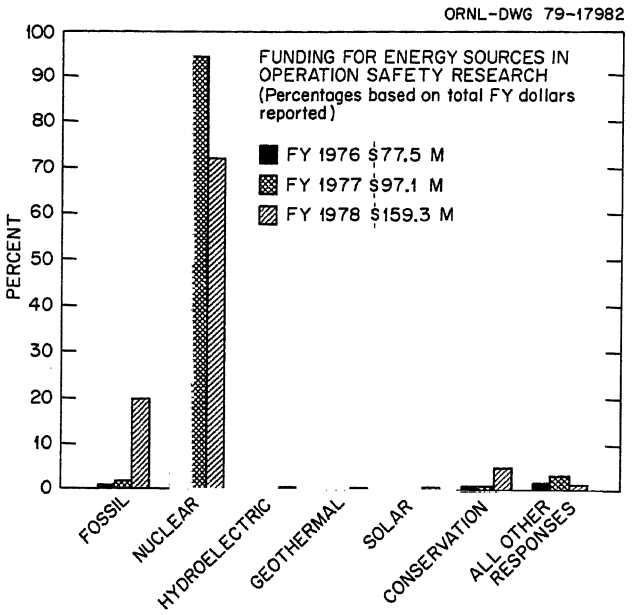


Fig. 5.1. Comparison of FY 1976, FY 1977, and FY 1978 percentages of funding for energy sources in operational safety research.

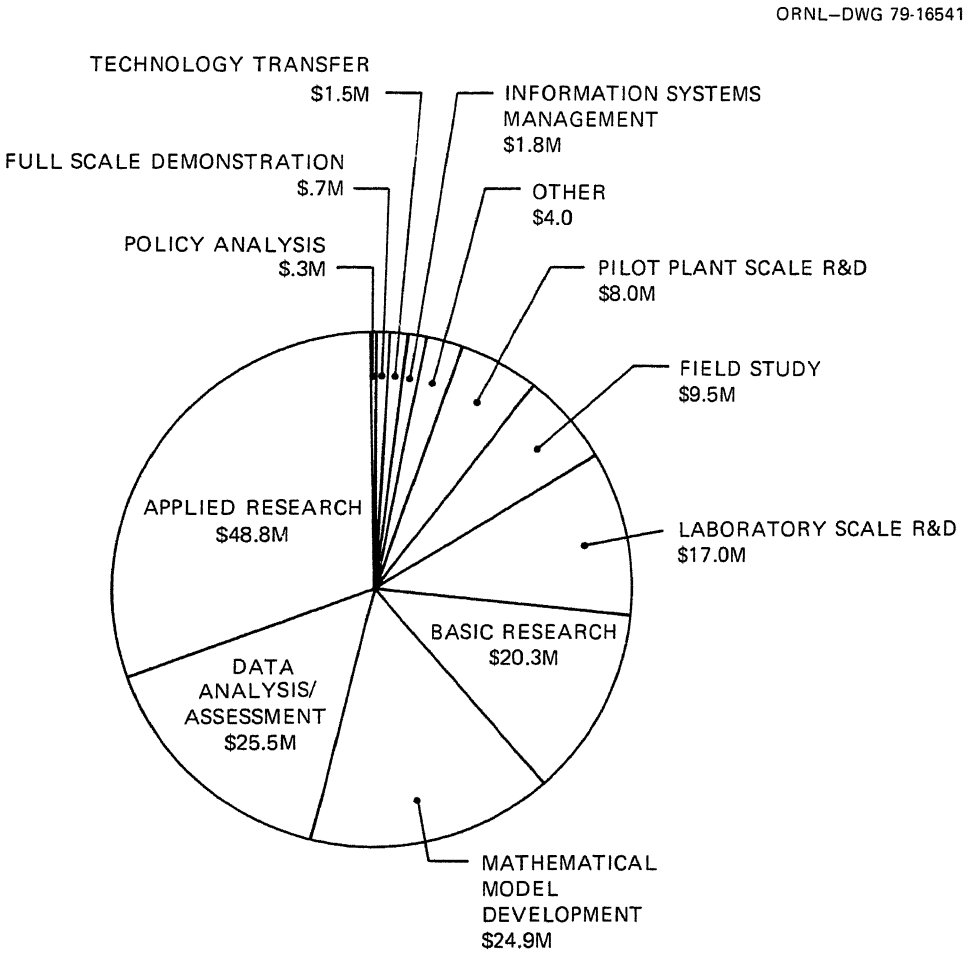


Fig. 5.2. Distribution of funding by type of activity in operational safety research.

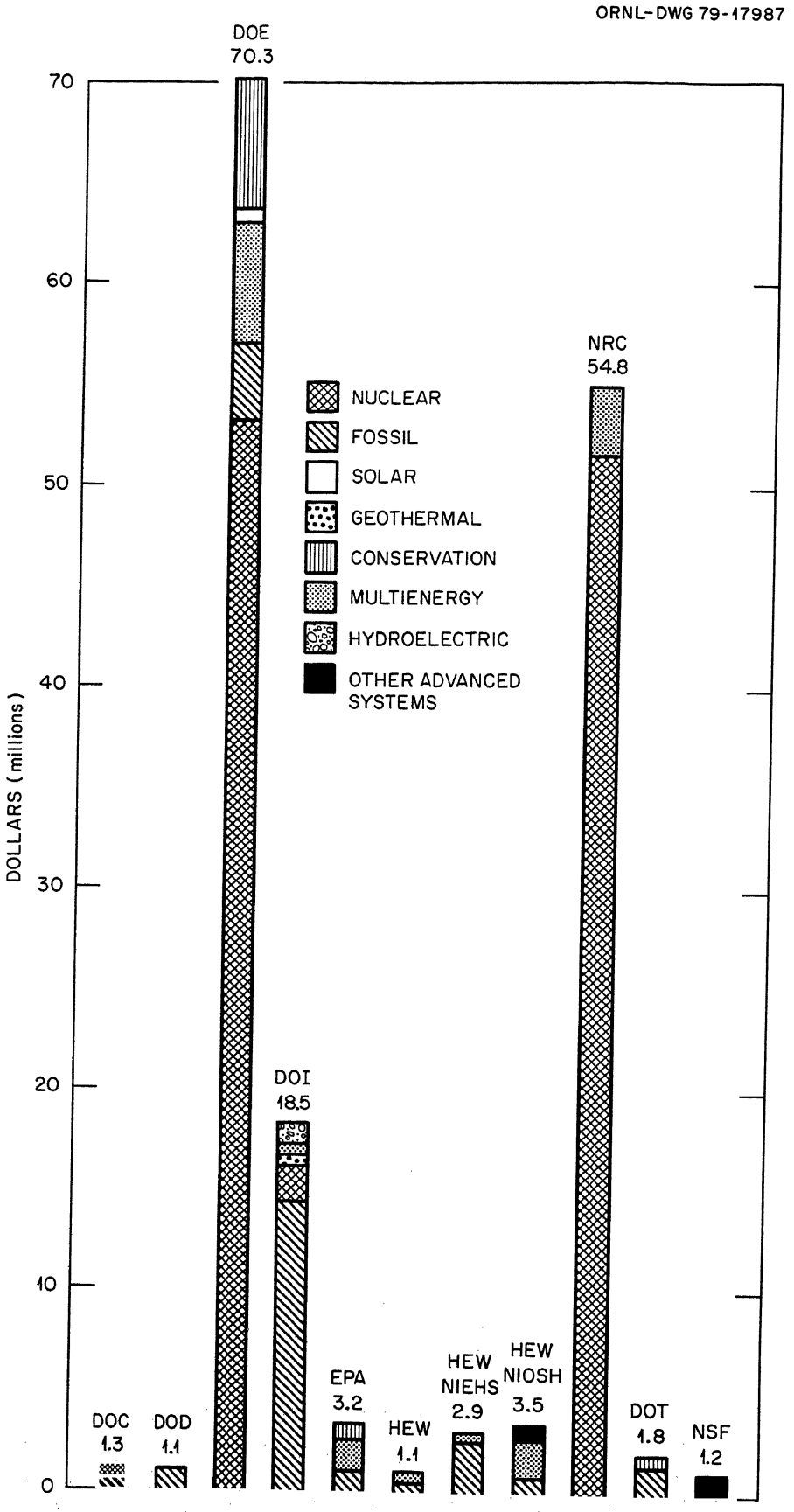
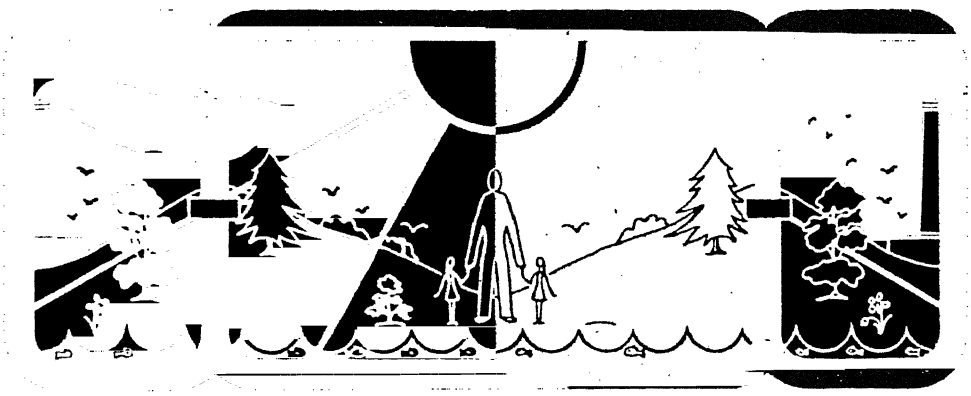


Fig. 5.3. Monitoring agency funding by energy source for operational safety research.



APPENDIX A

INVENTORY QUESTIONNAIRE (FORM DOE/EV-294)

FORM DOE/EV-294
(4-78)

FORM APPROVED
OMB NO. 038-R0188

Inventory of Federal Energy-Related Environmental and Safety Research

FY 1978

DEPARTMENT OF ENERGY
Office of the Assistant Secretary
for Environment
Division of Environmental Impacts

INSTRUCTIONS FOR PROJECT DOCUMENTATION -- INVENTORY OF FEDERAL ENERGY-RELATED ENVIRONMENTAL AND SAFETY RESEARCH

For further assistance contact DOE, Division of Environmental Impacts: Phone (301) 353-3311 or FTS 233-3311.

SECTION I - ADMINISTRATIVE

A. PROJECT TITLE

1. Project Title

Use official title of project or contract in 25 words or less.

2. Project Control Number

The numerical or letter-number combination that the performing organization uses and recognizes as a unique descriptor of the project. (This number may be one assigned by the monitoring organization.)

3. Date Questionnaire Completed

This date determines the currency of the information being supplied; month and year is sufficient.

B. PROJECT STATUS

1-3. Check the status of the project in FY 1978.

C. PRINCIPAL INVESTIGATOR

1-5. Name and Address

This information identifies the person actually performing the experiment or having direct supervisory responsibility for the project.

6. Performing Organization

The organization that provides the principal investigator with administrative, facility, and/or logistic support. In those areas where a grant or contract is with a single investigator the performing organization should be indicated as Principal Investigator.

7. Principal Investigator's Telephone Numbers

Enter the commercial telephone number and/or the Federal TeleCommunications System telephone number as appropriate.

D. PROJECT MONITOR

1. Monitoring Agency

The Federal Agency having direct contact with the principal investigator and the performing organization. Use appropriate abbreviation at the Departmental level (e.g., DOE, DHEW, EPA, DOA, DOC, DOD, DOI, DOT, NSF, NRC, TVA, etc.).

2. Monitoring Agency Division or Office

Write the complete title of the subunit within the monitoring agency that has cognizance or direct supervision over the principal investigator and the performing organization.

3. Monitor's Project Officer

The individual in the monitoring organization who has direct cognizance of the project and who provides a point of contact with the principal investigator.

4. Project Officer's Telephone Numbers

Enter the commercial telephone number and/or Federal TeleCommunications System telephone number as appropriate.

E. PROJECT ACCOUNTING

1-5. Type of Funding Activity

The method chosen by the funding organization to provide the monetary resources for the project. Provide grant number, contract number or, in the case of an interagency agreement, the name of the funding agency.

6-7. Funding Organization(s)

The organization(s) (Agency, Departmental, or Institutional level) providing part or all of the funds for part or all of the performance or the project. In most cases, the funding agency is the same as the monitoring agency. When there are two or more funding agencies, indicate amount for each separately. Indicate funds as dollars in thousands.

F. PROJECT SCHEDULE

1. Date Project Originated

Enter month and year.

2. Expected End Date

The month and year the project is expected to terminate. If there is no recognized end date, enter N/A.

SECTION II - GENERAL CATEGORIES

A. TYPE OF ACTIVITY

Check one or more activities as appropriate to your project. If some combination of activities 1 through 11 does not adequately describe your project, use item 12 to specify.

B. RELATED ENERGY SOURCE

This subsection categorizes your project by its relationship to an energy source. Use percentages to indicate emphasis. Examples: If your project concerns handling of waste heat from power plants, it may apply to Fossil Fuels/General (25%), Nuclear Fuels/General (25%), Solar/General (25%), and Geothermal/General (25%). If the project involves utilization or conversion of waste heat, it may apply only to Conservation/General (100%). If the project relates to general environmental impacts and is applicable to all energy sources, you should categorize the project as "ALL OF THE ABOVE" (100%).

C. STAGE OF ENERGY CYCLE

This subsection categorizes your project by its relation to energy production cycle stages. Use percentage(s) to indicate the stage(s) of the cycle which your project emphasizes. If your project encompasses two or more stages, indicate appropriate percentages for the several stages. If your project is general in nature and is supportive of all cycles or processes, mark 100% in the "ALL OF THE ABOVE" box.

D. POLLUTANTS CONSIDERED

Check those contaminants pertaining to your project.

E. ENVIRONMENTAL BACKGROUND

If your project is concerned with the environmental background in which pollutants are deposited, through which pollutants are transported, or in which pollutant-affected organisms or ecological systems develop, categorize by checking appropriate circle(s).

F. GEOGRAPHIC REGIONS

If your project has a special relationship or direct applicability to a particular geographic area, check the appropriate circle(s). (See map, Attachment A, for Region definitions.)

G. U. S. COASTLINES

If your project has a special relationship or direct applicability to a particular U. S. Coastline, check the appropriate circle(s). (See map, Attachment A, for Coastline limits.)

H. AQUATIC AREAS

Check the type of body of water to which your study is directly related.

SECTION III - OPERATIONAL SAFETY R&D CATEGORIES

Indicate the type of research and emphasis by percentages. Percentages should total 100%.

SECTION IV - ENVIRONMENTAL CONTROL TECHNOLOGY R&D CATEGORIES

Indicate the type of research and emphasis by percentages. Percentages should total 100%.

SECTION V - BIOMEDICAL AND ENVIRONMENTAL RESEARCH CATEGORIES

Use percentage(s) to indicate project emphasis according to the subcategories listed. The percentages in each subsection should total 100%.

SECTION VI - PROJECT DESCRIPTION

A. DESCRIPTION IN SUMMARY FORM

1. Objective(s)

State project objectives, quantifying where possible (e.g., "demonstrate 95% recovery of sulfur from raw gas with molten salt recycling at a rate of one gallon per minute").

2. Approach

Describe the technical approach to the project, i.e., how the work is to be done.

3. Product/Results

Describe the final products or results expected from the project and those obtained to date. The importance and relevance of the results to energy-related environmental and safety projects should also be indicated.

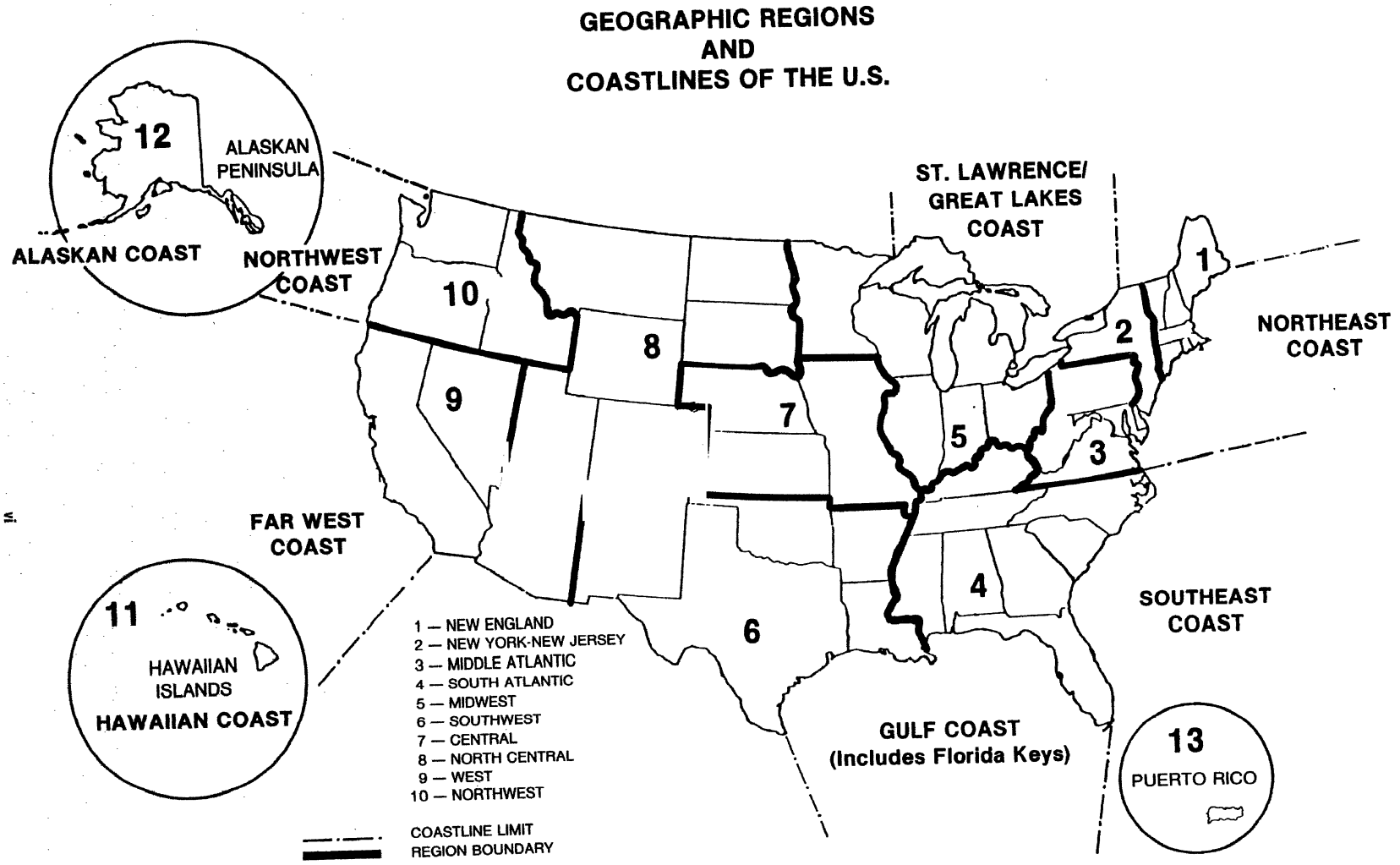
B. PUBLICATIONS

Include all publications in the following reference format.

Reports:	Author(s), "Title," Series No., Publishing Agency or University, date.
Journals:	Author(s), "Title," Journal Name, Vol. No. (Series No.), date.
Books:	Author(s), Title, Publishing Co., Location, date.
Chapters Within Books	Author(s), "Title," in Book Title, Publishing Co., Location, date.

SECTION VII - KEY WORDS

Circle up to six key words that best characterize your project. If the Key Word List is inadequate, provide up to two additional words which describe your project (maximum total eight words). List and define additional words in space provided at the bottom of the page.


GEOGRAPHIC REGIONS
AND
COASTLINES OF THE U.S.
12
ALASKAN PENINSULA
ALASKAN COAST
NORTHWEST COAST
ST. LAWRENCE/ GREAT LAKES COAST
NORTHEAST COAST
FAR WEST COAST
SOUTHEAST COAST
GULF COAST (Includes Florida Keys)
11
HAWAIIAN ISLANDS
HAWAIIAN COAST
13
PUERTO RICO
1 — NEW ENGLAND
2 — NEW YORK-NEW JERSEY
3 — MIDDLE ATLANTIC
4 — SOUTH ATLANTIC
5 — MIDWEST
6 — SOUTHWEST
7 — CENTRAL
8 — NORTH CENTRAL
9 — WEST
10 — NORTHWEST
COASTLINE LIMIT
REGION BOUNDARY

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(4-78)

INVENTORY OF FEDERAL ENERGY-RELATED ENVIRONMENTAL AND SAFETY RESEARCH

PROJECT DOCUMENTATION — FY 1978

SECTION I — ADMINISTRATIVE

(Please print in black ink or type)

A. PROJECT TITLE

1. PROJECT TITLE

	2. PROJECT CONTROL NUMBER	3. DATE QUESTIONNAIRE COMPLETED Month / Year

B. STATUS (Check)

1. ○ NEW PROJECT 2. ○ REVISED PROJECT 3. ○ PROJECT TERMINATED

C. PRINCIPAL INVESTIGATOR

1. NAME (Last, first, middle initial)

2. BUSINESS ADDRESS

3. CITY	4. STATE	5. ZIP

6. PERFORMING ORGANIZATION (Full name)

7. TELEPHONE

COMMERCIAL Area Code ( ) _____ FTS _____

D. PROJECT MONITOR

1. MONITORING AGENCY(s) (Full name)

2. MONITORING AGENCY DIVISION OR OFFICE (Full name)

3. MONITOR'S PROJECT OFFICER (Last, first, middle initial)	4. TELEPHONE
	Area Code COMMERCIAL ( ) _____ FTS _____

E. PROJECT ACCOUNTING

1. TYPE OF FUNDING ACTIVITY (Check one)

a. ○ Contract No. _____
b. ○ Grant No. _____
c. ○ Interagency agreement _____ (funding agency)
d. ○ Agency in-house effort
e. ○ EPA "pass-thru" funding

2. FUNDING ($ thousands)

Funding Organization(s)	FY 78	*Projected FY 79
a.	$	$
b.	$	$

*Only projects associated with Atmospheric Sciences

F. PROJECT SCHEDULE

1. DATE PROJECT ORIGINATED Month / Year
2. EXPECTED END DATE Month / Year

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INVENTORY OF FEDERAL ENERGY-RELATED ENVIRONMENTAL AND SAFETY RESEARCH

PROJECT CONTROL NUMBER _____

SECTION II — GENERAL CATEGORIES

(Enter Project Percentage In Applicable Boxes and Check Applicable Circles)

A. TYPE OF ACTIVITY

1. ○ BASIC RESEARCH
2. ○ APPLIED RESEARCH (conducted to fulfill special requirements)
3. ○ LABORATORY SCALE R&D
4. ○ TECHNOLOGY TRANSFER
5. ○ FIELD STUDY
6. ○ PILOT PLANT SCALE R&D
7. ○ FULL SCALE DEMONSTRATION
8. ○ MATHEMATICAL MODEL DEVELOPMENT
9. ○ DATA ANALYSIS/ASSESSMENTS
10. ○ INFORMATION SYSTEMS MANAGEMENT
11. ○ POLICY ANALYSIS
12. ○ OTHER (Specify) _____

B. RELATED ENERGY SOURCE

1. [ ] FOSSIL FUELS (General)
2. [ ] COAL
3. [ ] OIL AND GAS
4. [ ] OIL SHALES AND TAR SANDS
5. [ ] NUCLEAR FUELS (General)
6. [ ] NUCLEAR FISSION
7. [ ] NUCLEAR FUSION
8. [ ] HYDROELECTRIC
9. [ ] GEOTHERMAL
10. [ ] SOLAR
11. [ ] OCEAN THERMAL
12. [ ] BIOMASS
13. [ ] WIND
14. [ ] CONSERVATION
15. [ ] OTHER ADVANCED SYSTEMS (e.g., Magnetohydrodynamics)
16. [ ] ALL OF THE ABOVE

100%

17. ○ NOT APPLICABLE

C. STAGE OF ENERGY CYCLE

1. [ ] EXTRACTION
2. [ ] SECONDARY RECOVERY
3. [ ] TERTIARY RECOVERY
4. [ ] COMBUSTION IN SITU
5. [ ] CONVERSION IN SITU
6. [ ] TRANSPORTATION/TRANSMISSION
7. [ ] STORAGE
8. [ ] PROCESSING
9. [ ] CONVERSION
10. [ ] COMBUSTION — UTILIZATION
11. [ ] WASTE MANAGEMENT
12. [ ] DECONTAMINATION AND DECOMISSIONING
13. [ ] ALL OF THE ABOVE

100%

14. ○ NOT APPLICABLE

D. POLLUTANTS CONSIDERED

1. ○ SULFUR OXIDES
2. ○ NITROGEN OXIDES
3. ○ SULFATES
4. ○ NITRATES
5. ○ CARBON OXIDES
6. ○ HYDROCARBONS
7. ○ PHOTOCHEMICAL OXIDANTS
8. ○ OTHER NOXIOUS GASES
9. ○ PARTICULATES/DUST
10. ○ HEAVY METALS
11. ○ ORGANICS (Excl. Hydrocarbons)
12. ○ RADIATION, IONIZING (Nuclear)
13. ○ RADIATION, NONIONIZING (Infrafred, Microwave)
14. ○ NOISE/VIBRATION
15. ○ HEAT/THERMAL
16. ○ VISUAL AESTHETICS
17. ○ ODOR
18. ○ AGRICULTURAL WASTES
19. ○ URBAN WASTES
20. ○ WASTEWATER — TREATED RESIDUALS
21. ○ SLUDGE/SEDIMENTS
22. ○ SUSPENDED SOLIDS
23. ○ DISSOLVED SOLIDS/SALINITY
24. ○ NUTRIENTS
25. ○ MICROBIOLOGICAL AGENTS
26. ○ PESTICIDES/HERBICIDES
27. ○ OTHER (Specify) _____
28. ○ NOT APPLICABLE

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INVENTORY OF FEDERAL ENERGY-RELATED ENVIRONMENTAL AND SAFETY RESEARCH

PROJECT CONTROL NUMBER_____

SECTION II — GENERAL CATEGORIES (Continued)

(Check Appropriate Circles)

E. ENVIRONMENTAL BACKGROUND

1. ○ ATMOSPHERIC
2. ○ TERRESTRIAL
3. ○ FRESHWATER
4. ○ ESTUARINE
5. ○ MARINE
6. ○ NOT APPLICABLE

F. GEOGRAPHIC REGIONS (see instruction & map)

1. ○ NEW ENGLAND
2. ○ NEW YORK -- NEW JERSEY
3. ○ MIDDLE ATLANTIC STATES
4. ○ SOUTH ATLANTIC STATES
5. ○ MIDWEST
6. ○ SOUTHWEST
7. ○ CENTRAL STATES
8. ○ NORTH CENTRAL STATES
9. ○ WEST
10. ○ NORTHWEST
11. ○ HAWAII
12. ○ ALASKA
13. ○ PUERTO RICO
14. ○ CONTINENTAL (all states excluding Alaska, Hawaii)
15. ○ INTERNATIONAL (excluding U.S.)
16. ○ WORLDWIDE (including land & water)
17. ○ NOT APPLICABLE

G. U.S. COASTLINES (see instructions & map)

1. ○ NORTHEAST COAST
2. ○ SOUTHEAST COAST
3. ○ GULF COAST
4. ○ WEST COAST
5. ○ NORTHWEST COAST
6. ○ ALASKAN COAST
7. ○ HAWAIIAN COAST
8. ○ PUERTO RICAN COAST
9. ○ NOT APPLICABLE

H. AQUATIC AREAS

1. ○ DEEP OCEAN
2. ○ CONTINENTAL SHELF
3. ○ LAKE
4. ○ RIVER
5. ○ SURFACE WATERSHED
6. ○ GROUNDWATER
7. ○ IMPOUNDMENT (man-made lake)
8. ○ NOT APPLICABLE

SECTION III — OPERATIONAL SAFETY R&D CATEGORIES (enter %)

A.

RESEARCH TO ENSURE THAT ALL ENERGY-RELATED OPERATIONS ARE CONDUCTED IN A MANNER THAT WILL MINIMIZE RISKS TO THE HEALTH AND SAFETY OF THE PUBLIC AND EMPLOYEES, AND WILL PROVIDE ADEQUATE PROTECTION OF PROPERTY AND THE ENVIRONMENT — INCLUDES:

1. [ ] ENVIRONMENTAL, SAFETY, HEALTH ASSURANCE MEASUREMENT AND MONITORING
2. [ ] ENVIRONMENTAL, SAFETY, HEALTH STANDARDS AND CRITERIA
3. [ ] ENVIRONMENTAL, SAFETY, HEALTH SUPPORT AND ASSISTANCE
4. [ ] SPECIAL OPERATIONS (site-specific)

100%

○ NOT APPLICABLE

SECTION IV — ENVIRONMENTAL CONTROL TECHNOLOGY R&D CATEGORIES (enter %)

A.

ACTIVITIES DIRECTED AT RESEARCH, DEVELOPMENT AND DEMONSTRATION OF PROCESSES, PROCEDURES, SYSTEMS, SUBSYSTEMS, AND STRATEGIES WHICH DIRECTLY OR INDIRECTLY ELIMINATE, MINIMIZE, OR MITIGATE ENVIRONMENTAL IMPACTS — INCLUDING:

1. [ ] AIR QUALITY CONTROLS
2. [ ] SOLID WASTE MANAGEMENT AND LAND RECLAMATION
3. [ ] WATER CONTROL AND PROTECTION
4. [ ] DISPOSAL OF SURPLUS CONTAMINATED EQUIPMENT AND FACILITIES
5. [ ] ENERGY MATERIALS TRANSPORT

100%

○ NOT APPLICABLE

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INVENTORY OF FEDERAL ENERGY-RELATED ENVIRONMENTAL AND SAFETY RESEARCH

PROJECT CONTROL NUMBER_____

SECTION V — BIOMEDICAL AND ENVIRONMENTAL RESEARCH CATEGORIES (enter %)

A. CHARACTERIZATION, MEASUREMENT, AND MONITORING

1. [ ] CHARACTERIZATION - BASELINE MEASUREMENTS
2. [ ] CHARACTERIZATION - OPERATING SITE MEASUREMENTS
3. [ ] ADVANCED CONCEPTS, COMPONENTS AND SYSTEMS
4. [ ] APPLIED SYSTEMS
5. [ ] QUALITY ASSURANCE AND STANDARDS
6. [ ] OCCUPATIONAL HEALTH MONITORING
7. [ ] PUBLIC HEALTH MONITORING

100%

○ NOT APPLICABLE

B. PHYSICAL AND CHEMICAL PROCESSES AND EFFECTS

1. [ ] ENVIRONMENTAL TRANSPORT, DISPERSION AND DIFFUSION
2. [ ] PHYSICAL AND CHEMICAL TRANSFORMATION OF POLLUTANTS
3. [ ] PROCESSES BY WHICH POLLUTANTS ARE REMOVED FROM LAND, AIR AND WATER
4. [ ] POLLUTANT EFFECTS ON MATERIALS
5. [ ] TERRESTRIAL DISTURBANCES RESULTING FROM RESOURCE EXTRACTION
6. [ ] METEOROLOGICAL/CLIMATIC EFFECTS OF HEAT, MOISTURE AND POLLUTANT RELEASES
7. [ ] RESEARCH ON MEASUREMENT OF POLLUTANTS IN ENVIRONMENTAL MEDIA
8. [ ] RESEARCH TO DETERMINE ULTIMATE ENVIRONMENTAL FATE

100%

○ NOT APPLICABLE

C. INTEGRATED ASSESSMENT

1. [ ] ENVIRONMENTAL INFORMATION SYSTEMS
2. [ ] INTEGRATED HEALTH/ECOLOGICAL ASSESSMENT
3. [ ] TECHNOLOGY IMPACT ASSESSMENT
4. [ ] REGIONAL ENVIRONMENTAL ASSESSMENT
5. [ ] NATIONAL ENVIRONMENTAL ASSESSMENT
6. [ ] ENVIRONMENTAL POLICY ANALYSIS

100%

○ NOT APPLICABLE

D. HEALTH EFFECTS

1. [ ] CARCINOGENESIS
2. [ ] TERATOGENESIS
3. [ ] MUTAGENESIS
4. [ ] METABOLIC/ELIMINATION
5. [ ] HUMAN DAMAGE, REPAIR AND RECOVERY
6. [ ] RENAL/HEPATIC
7. [ ] IMMUNOLOGIC/HEMATOLOGIC
8. [ ] CARDIOVASCULAR
9. [ ] GASTROINTESTINAL
10. [ ] MUSCULAR/SKELETAL
11. [ ] RESPIRATORY
12. [ ] NEUROLOGIC/NEUROBEHAVIORAL
13. [ ] NONHUMAN DOSE-EFFECTS STUDIES
14. [ ] HUMAN HAZARD/RISK ASSESSMENT
15. [ ] EPIDEMIOLOGICAL STUDIES

100%

○ NOT APPLICABLE

E. ECOLOGICAL/BIOLOGICAL PROCESSES AND EFFECTS

1. [ ] STRUCTURE/FUNCTION/MANAGEMENT OF ECOLOGICAL BIOLOGICAL SYSTEMS
2. [ ] POLLUTANT FATE/CYCLING IN ECOLOGICAL BIOLOGICAL SYSTEMS
3. [ ] ECOLOGICAL/BIOLOGICAL RESPONSE/RECOVERY FROM PHYSICAL DISTURBANCES (i.e. Thermal Changes)
4. [ ] ECOLOGICAL/BIOLOGICAL RESPONSE/RECOVERY FROM CHEMICAL DISTURBANCES
5. [ ] ECOLOGICAL/BIOLOGICAL RESPONSE/RECOVERY FROM BIOLOGICAL DISTURBANCES

100%

○ NOT APPLICABLE

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INVENTORY OF FEDERAL ENERGY-RELATED ENVIRONMENTAL AND SAFETY RESEARCH

PROJECT CONTROL NUMBER_____

SECTION VI — PROJECT DESCRIPTION

A. DESCRIPTION IN SUMMARY FORM (200 words total). TO INCLUDE THE FOLLOWING INFORMATION ABOUT THE PROJECT:

1. STATEMENT OF PROJECT OBJECTIVES, 2. APPROACH CHOSEN AS PATH TO OBJECTIVE(S) 3. STATEMENT OF PRODUCT OR RESULTS EXPECTED IN THE FUTURE AND THOSE OBTAINED TO DATE (include all Publications separately in space provided).

B. PUBLICATIONS:

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INVENTORY OF FEDERAL ENERGY-RELATED ENVIRONMENTAL AND SAFETY RESEARCH

PROJECT CONTROL NUMBER _____

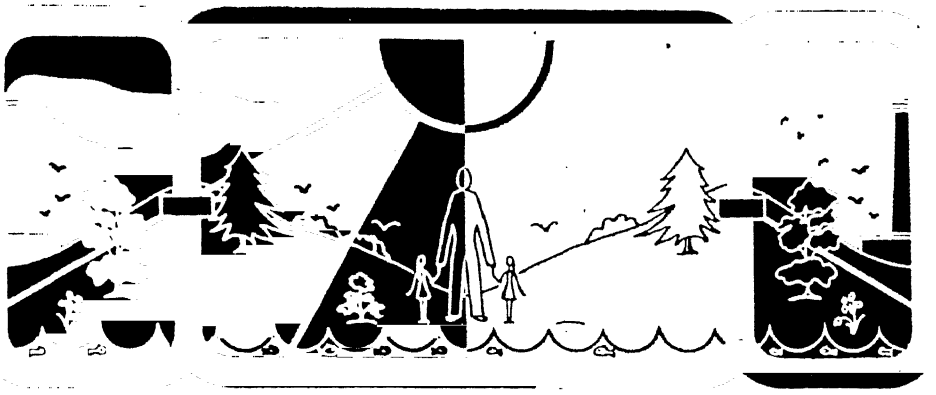
SECTION VII — KEY WORDS (Circle)

Aerosols
Aging
Agriculture
Americium
Animals
Antimony
Arsenic
Atmosphere
Bacteria
Biochemistry
Biomass
Biosynthesis
Blood
Bones
Boron
Brain
Cadmium
Calcium
Carcinogenesis
Cells
Cesium
Chlorine
Chromium
Climates
Combustion
Computers
Construction
Copper
Demography
Digestive System
Diseases
DNA
Ecology
Economics
Ecosystems
Effluents
Electrons
Emissions
Emotional Stress
Endocrine System
Engineering
Enzymes
Epidemiology
Excretory System
Exertion
Fate
Fauna
Fishes
Flora
Foods
Forests
Freshwater
Fungi
Gamma Ray
Genetics
Geology
Ground Water
Hydrocarbons
Hydrology
Immunology
Information Systems
Infrafred
Ingestion
Inhalation
Insects
Instrumentation
Invertebrates
Iodine
Larvae
Lead
Liver
Lungs
Magnetism
Manganese
Marine
Mathematical Models
Medicine
Membranes
Mercury
Metabolism
Microorganisms
Mining
Mutagenesis
Mutation
Neoplasms
Nervous System
Neurology
Neutrons
Nickel
Nitrogen
Oil Spills
Oxidation
Ozone
Packaging
Particulates
Pathogenesis
Pharmacology
Photons
Physical Stress
Phytoplankton
Plumes
Plutonium
Population Dynamics
Power Plants
Protein
Radiation
Radioactivity
Radioisotopes
Radionuclides
Reactors
Reclamation
Reproduction
Respiration
Risk Assessment
RNA
Sabotage
Safety
Sampling
Screening
Scrubber
Sediments
Seismology
Selenium
Sewage
Shipping
Skin
Socioeconomics
Sociology
Soils
Statistics
Sulfur
Surface Water
Surveillance
Synergism
Synthesis
Teratology
Terminal Storage
Toxicology
Transportation
Viruses
Vertebrates
Zooplankton

Additional Key Words and Definitions

1. _____ — _____
2. _____ — _____

GPO 929 999



APPENDIX B

PRINCIPAL CONTACTS

OFFICE OF THE ENVIRONMENT, DEPARTMENT OF ENERGY

Name	Office	Mail station	Telephone No.
E. R. Williams	DPA	6134, 20 Mass	(202) 376-9073
D. M. Monti	DTA	4113, 20 Mass	(202) 376-4406
R. D. Shull	DEI	E-201, GTN	(301) 353-3311
J. Hock	DRA	E-201, GTN	(301) 353-4258
C. W. Eddington	DHEER	E-201, GTN	(301) 353-3251
W. H. Weyzen	DHHS	E-201, GTN	(301) 353-5355
C. E. Carter	DHER	E-201, GTN	(301) 353-5468
J. Swinebroad	DER	E-201, GTN	(301) 353-4208
R. W. Wood	DPCSR	E-201, GTN	(301) 353-3213
R. J. Catlin	NEPA	E-201, GTN	(301) 353-3033
H. Hollister	DOES	E-201, GTN	(301) 353-3157
W. E. Mott	DECE	E-201, GTN	(301) 353-3016
R. W. Barber	DSE	E-201, GTN	(301) 353-3548
T. J. Gross	Federal Inventory Coordinator for OER	E-201, GTN	(301) 353-5586

OTHER DEPARTMENT OF ENERGY OFFICES

Name	Office	Mail station	Telephone No.
O. G. Walden c/o H. C. Myers	ASCS CS-820	2221C, 20 Mass	(202) 376-1626
D. Sewell c/o P. W. Donahue	ASDP DP-27	A-362, GTN	(301) 353-5553
L. E. Moses c/o E. H. Peehan	ADM., EIA EI-853	461, FED	(202) 566-7983
D. J. Bardin c/o E. Manning	ADM., ERA R6-2	5204, M Street	(202) 254-7500
J. M. Deutch c/o V. Zeoli	DIR., ER ER-121	J-309, GTN	(301) 353-3444
R. D. Thorne c/o E. L. Govan	ASET ET	3235, 20 Mass	(202) 376-4542
J. Nardella	ET (fossil energy)	4128, 20 Mass	(202) 376-1725

Name	Office	Mail station	Telephone No.
C. B. Curtis c/o P. M. Feine	CHM., FERC RC-6	22, 825 NCA	(202) 275-3925
P. S. Hughes c/o P. S. Capozzi	ASIR IR-132	8G-031, FORSTL	(202) 252-5736
H. E. Bergold, Jr. c/o H. Jaffee	ASIA IA-41	7F-031, FORSTL	(202) 252-6144
A. L. Alm c/o T. U. Snyder	ASPE PE-312	4130, FED	(202) 566-3005
G. S. McIssac c/o E. S. Burton	ASRA RA	3426, FED	(202) 566-7469

DEPARTMENT OF ENERGY LABORATORIES

Name	Address	Telephone No.
A. Scott	Brookhaven National Laboratory Upton, New York 11973	(516) 345-4156 FTS 664-4156
R. S. Harvey	E. I. DuPont de Nemours & Co. Savannah River Laboratory Aiken, South Carolina 29801	(803) 649-3651 FTS 239-3020
B. Talmi	Oak Ridge National Laboratory P.O. Box X Oak Ridge, Tennessee 37830	(615) 572-4335 FTS 850-6488
R. H. Huebner	Argonne National Laboratory 970 South Cass Avenue Argonne, Illinois 60439	(312) 972-3804 FTS 972-3804
H. F. Martz, Jr.	University of California Los Alamos Scientific Laboratory P.O. Box 1663 Los Alamos, New Mexico 87545	(505) 667-4567 FTS 843-4567
G. Welch	University of California Lawrence Berkeley Laboratory Berkeley, California 94720	(415) 843-2740, ext. 6292 FTS 451-6292
D. Layton	University of California Lawrence Livermore Laboratory Livermore, California 94550	(415) 447-3880 FTS 532-3880
P. Dionne	Battelle Pacific Northwest Laboratory Richland, Washington 99352	(509) 942-2452 FTS 444-7511, ext. 942-2452

OTHER FEDERAL AGENCIES

Name	Address	Telephone No.
	Department of Agriculture	
W. V. Barton Director, Office of Energy	Department of Agriculture Office of the Secretary Washington, D.C. 20250	(202) 447-2455
T. K. Bauer Current Research Information System, Agriculture Information Division	Office of the Deputy Director for Technical Information Systems National Agriculture Library Building Beltsville, Maryland 20705	(301) 344-3837
	Department of Commerce	
R. B. Grant Office of Environmental Affairs	U.S. Department of Commerce Room 3425 Washington, D.C. 20230	(202) 377-2652
G. Rosasco	National Bureau of Standards Room 1002, Administration Building Washington, D.C. 20234	(301) 921-3132
A. Bestul	National Oceanic and Atmospheric Administration RD1, 6010 Executive Boulevard Rockville, Maryland 20852	(301) 655-4000
S. R. Gallor Deputy Assistant Secretary	U.S. Department of Commerce Assistant Secretary for Science and Technology Washington, D.C. 20230	(202) 377-4335
	Department of Defense	
R. M. Davis Deputy Under Secretary of Defense for Research and Engineering (Research and Advanced Technology)	Office of the Under Secretary of Defense The Pentagon Washington, D.C. 20301	(202) 545-6700
	Department of Health, Education and Welfare	
B. Osheroff	National Institute for Occupational Safety and Health 5600 Fishers Lane Rockville, Maryland 20852	(301) 443-6377

Name	Address	Telephone No.
P. Schambra	National Institute of Environmental Health Sciences Research Triangle Park, North Carolina 27709	(919) 541-3467
J. Elliott	National Cancer Institute 9000 Rockville Pike Bethesda, Maryland 20014	(301) 496-5515
D. A. Elliott Smithsonian Science Information Exchange for the National Cancer Institute	Current Cancer Research Project Analysis Center Smithsonian Science Information Exchange Room 300, 1730 M Street NW Washington, D.C. 20036	(202) 381-4211
B. Holliman For all national institutes of NIH except National Cancer Institute	Research Documentation Section National Institutes of Health 5333 Westbard Avenue Bethesda, Maryland 20014	(301) 496-7543
	Department of the Interior	
B. Blanchard Environmental Project Review for Fish and Wildlife Service Bureau of Mines Geological Survey Bureau of Reclamation	U.S. Department of the Interior Office of the Secretary Washington, D.C. 20240	(202) 343-1100
	Department of Transportation	
D. R. Trilling Environment, Safety, and Consumer Affairs Federal Aviation Administration Federal Highway Administration Federal Railroad Administration National Transportation Safety Board National Highway Traffic Safety Administration Urban Mass Transit Administration	Office of the Secretary of Transportation Washington, D.C. 20590	(202) 426-4000

Name	Address	Telephone No.
	Bonneville Power Administration	
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	U.S. Environmental Protection Agency	
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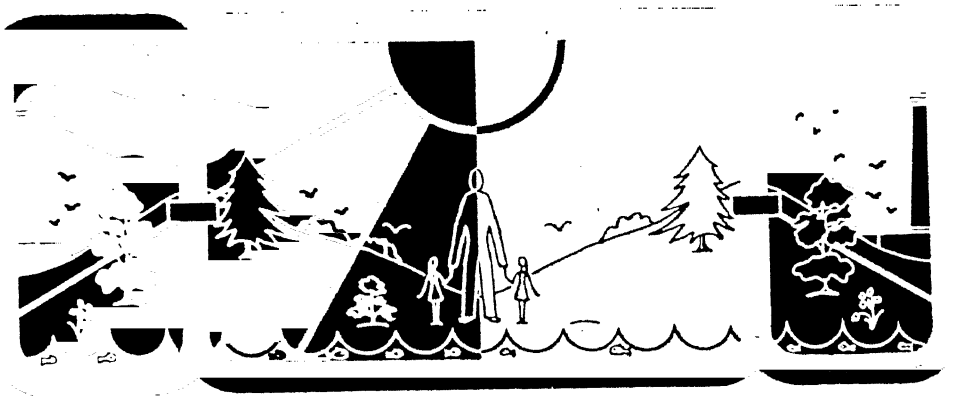
	National Science Foundation	
H. Hines	National Science Foundation 1800 G Street NW Washington, D.C. 20550	(202) 632-5876
D. Hunt	National Center for Atmospheric Research National Science Foundation 1800 G Street NW Washington, D.C. 20550	(202) 632-7300
	Tennessee Valley Authority	
H. R. Hickey c/o L. Brown	Tennessee Valley Authority 315 401 Building Chattanooga, Tennessee 37401	(615) 755-3155 FTS 854-3155
	Nuclear Regulatory Commission	
C. Jupiter	Office of Nuclear Regulatory Research U.S. Nuclear Regulatory Commission Washington, D.C. 20556	(301) 427-4362



APPENDIX C

AGENCY ABBREVIATIONS

LOG AGENCY ABBREVIATIONS

DOC	Department of Commerce
DOC/ASEA	Assistant Secretary — Environmental Affairs
DOC/NBS	National Bureau of Standards
DOC/NOAA	National Oceanographic and Atmospheric Administration
DOC/OWRA	Old West Regional Action Planning Commission
DOD	Department of Defense
DOE	Department of Energy
DOE/ANL	Argonne National Laboratory
DOE/AO	Albuquerque Operations Office
DOE/BNL	Brookhaven National Laboratory
DOE/C	Assistant Administrator — Conservation
DOE/CO	Chicago Operations Office
DOE/CSA	Assistant Administrator — Conservation and Solar Application
DOE/DP	Assistant Secretary — Defense Programs
DOE/EIA	Administrator — Energy Information Administration
DOE/EPA Pass Thru	EPA Pass Thru
DOE/ER	Director Office of Energy Research
DOE/ERC	Energy Research Center
DOE/ET	Assistant Secretary — Energy Technology
DOE/FE	Assistant Administrator — Fossil Energy
DOE/GJO	Grand Junction Office
DOE/H	Administration/Headquarters
DOE/IA	Assistant Secretary — International Affairs
DOE/IIR	Assistant Secretary — Intergovernmental and Institutional Relations
DOE/IO	Idaho Operations Office
DOE/LASL	Los Alamos Scientific Laboratory
DOE/LBL	Lawrence Berkeley Laboratory
DOE/LLL	Lawrence Livermore Laboratory
DOE/NE	Assistant Administrator — Nuclear Energy
DOE/NO	Nevada Operations Office
DOE/ORNL	Oak Ridge National Laboratory
DOE/ORO	Oak Ridge Operations Office
DOE/PA	Assistant Administrator — Planning and Analysis
DOE/PE	Assistant Secretary — Policy and Evaluation
DOE/PNL	Pacific Northwest Laboratory
DOE/RA	Assistant Secretary — Resource Applications
DOE/RO	Richland Operations Office
DOE/SGE	Assistant Administrator — Solar, Geothermal, and Advanced Energy Systems
DOE/SFO	San Francisco Operations Office
DOE/SRO	Savannah River Operations Office
DOI	Department of the Interior
DOI/BLM	Bureau of Land Management
DOI/BM	Bureau of Mines

DOI/BPA	Bonneville Power Administration
DOI/BR	Bureau of Reclamation
DOI/FWS	Fish and Wildlife Service
DOI/USGS	U.S. Geological Survey
DOT	Department of Transportation
DOT/ASESC	Assistant Secretary — Environment, Safety, and Consumer Affairs
DOT/FAA	Federal Aviation Administration
DOT/FHA	Federal Highway Administration
DOT/FRA	Federal Railroad Administration
DOT/NHTSA	National Highway Transportation Safety Administration
DOT/NTSB	National Transportation Safety Board
DOT/UMTA	Urban Mass Transit Administration
EPA	U.S. Environmental Protection Agency
EPA/A	Environmental Monitoring and Support Laboratory — Cincinnati
EPA/B	Industrial Environmental Research Laboratory — Cincinnati
EPA/C	Municipal Environmental Research Laboratory — Cincinnati
EPA/D	Health Effects Research Laboratory — Cincinnati
EPA/E	Environmental Monitoring and Support Laboratory — Research Triangle Park
EPA/F	Industrial Environmental Research Laboratory — Research Triangle Park
EPA/G	Environmental Sciences Research Laboratory — Research Triangle Park
EPA/H	Health Effects Research Laboratory — Research Triangle Park
EPA/J	Environmental Monitoring and Support Laboratory — Las Vegas
EPA/K	Environmental Research Laboratory — Athens
EPA/L	Environmental Research Laboratory — Ada
EPA/M	Environmental Research Laboratory — Corvalis
EPA/N	Environmental Research Laboratory — Duluth
EPA/P	Environmental Research Laboratory — Narragansett
EPA/Q	Environmental Research Laboratory — Gulf Breeze
EPA/R	
EPA/S	
EPA/T	
EPA/U	
EPA/V	Department of the Assistant Secretary — Energy
EPA/X	Department of the Assistant Secretary — Health
EPA/Z	Support Office — Research Triangle Park
EPAI	Region I — Boston
EPAII	Region II — New York
EPAIII	Region III — Philadelphia
EPAIV	Region IV — Atlanta
EPAV	Region V — Chicago

EPAVI	Region VI — Dallas
EPAVII	Region VII — Kansas City
EPAVIII	Region VIII — Denver
EPAIX	Region IX — San Francisco
EPAX	Region X — Seattle
FEA	Federal Energy Administration
HEW	Department of Health, Education, and Welfare
HEW/ASH	Assistant Secretary — Health
HEW/NAMDD	National Institute of Arthritis, Metabolism, and Digestive Diseases
HEW/NCHHD	National Institute of Child Health and Human Development
HEW/NCI	National Cancer Institute
HEW/NDR	National Institute of Dental Research
HEW/NGMS	National Institute of General Medical Sciences
HEW/NHLB	National Heart, Lung, and Blood Institute
HEW/NIA	National Institute on Aging
HEW/NIEHS	National Institute of Environmental Health Sciences
HEW/NIEHS/ADG	Office of Associate Director for Genetics
HEW/NIEHS/BB	Biometry Branch
HEW/NIEHS/EBC	Environmental Biology and Chemistry Branch
HEW/NIEHS/HHA	Office of Health Hazards Assessment
HEW/NIEHS/LBG	Laboratory of Biochemical Genetics
HEW/NIEHS/LBNT	Laboratory of Behavioral and Neurological Toxicology
HEW/NIEHS/LEB	Laboratory of Environmental Biophysics
HEW/NIEHS/LEM	Laboratory of Environmental Mutagenesis
HEW/NIEHS/LET	Laboratory of Environmental Toxicology
HEW/NIEHS/LP	Laboratory of Pharmacology
HEW/NIEHS/LPFT	Laboratory of Pulmonary and Functional Toxicology
HEW/NIEHS/LPK	Laboratory of Pharmacokinetics
HEW/NIEHS/P01ES	Extramural Program — P01ES Series
HEW/NIEHS/R01ES	Extramural Program — R01ES Series
HEW/NIEHS/1R01ES	Extramural Program — 1 R01ES Series
HEW/NIEHS/R23ES	Extramural Program — R23ES Series
HEW/NIH	National Institutes of Health (Division of Research Resources)
HEW/HEW/NNCDS	National Institute of Neurological and Communicative Disease and Stroke
HEW/NIOSH	National Institute for Occupational Safety and Health
HUD	Department of Housing and Urban Development
NASA	National Aeronautics and Space Administration
NRC	Nuclear Regulatory Commission
NSF	National Science Foundation
NSF/OR	Director of Research
NSF/RANN	Research Applied to National Needs
TVA	Tennessee Valley Authority

USCG	U.S. Coast Guard
USDA	Department of Agriculture

MONITORING AGENCY ABBREVIATIONS

ACS	American Cancer Society
AL	Ames Laboratory
APPA	American Public Power Association
AS	Aquatic Sciences, Inc.
CEQ	Council on Environmental Quality
CSM	Colorado School of Mines
CU	University of Colorado
DO	Dow Chemical Company
DOC	Department of Commerce
DOC/NBS	National Bureau of Standards
DOD	Department of Defense
DOE	Department of Energy
DOE/ANL	Argonne National Laboratory
DOE/AO	Albuquerque Operations Office
DOE/BNL	Brookhaven National Laboratory
DOE/BPNL	Battelle Pacific Northwest Laboratories
DOE/CO	Chicago Operations Office
DOE/CRBR	Clinch River Breeder Reactor Plant Project Office
DOE/GJO	Grand Junction Office
DOE/IO	Idaho Operations Office
DOE/LASL	Los Alamos Scientific Laboratory
DOE/LERC	Laramie Energy Research Center
DOE/LLL	Lawrence Livermore Laboratory
DOE/NO	Nevada Operations Office
DOE/NYHSL	New York Health Services Laboratory
DOE/ORNL	Oak Ridge National Laboratory
DOE/ORO	Oak Ridge Operations Office
DOE/PERC	Pittsburgh Energy Research Center
DOE/RO	Richland Operations Office
DOE/SFO	San Francisco Operations Office
DOE/SRO	Savannah River Operations Office
DOI	Department of the Interior
DOI/BLM	Bureau of Land Management
DOI/BM	Bureau of Mines
DOI/BPA	Bonneville Power Administration
DOI/BR	Bureau of Reclamation
DOI/FWS	Fish and Wildlife Service
DOI/NMFS	National Marine Fisheries Service
DOI/USGS	U.S. Geological Survey

DOT	Department of Transportation
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
FDA	Food and Drug Administration
FEA	Federal Energy Administration
FU	University of Florida
GTC	General Technologies Corporation
GU	University of Georgia
HEW	Department of Health, Education, and Welfare
HEW/NAMDD	National Institute of Arthritis, Metabolism, and Digestive Diseases
HEW/NCHHD	National Institute of Child Health and Human Development
HEW/NCI	National Cancer Institute
HEW/NDR	National Institute of Dental Research
HEW/NGMS	National Institute of General Medical Sciences
HEW/NHLB	National Heart, Lung, and Blood Institute
HEW/NIEHS	National Institute of Environmental Health Sciences
HEW/NIH	National Institutes of Health
HEW/NIOSH	National Institute for Occupational Safety and Health
HEW/NNCDS	National Institute of Neurological and Communicative Disease and Stroke
HEW/PHS	Public Health Service
HRI	Health Research, Inc.
HU	University of Hawaii
HUD	Department of Housing and Urban Development
LSU	Louisiana State University
MESA	Mining Enforcement and Safety Administration
MIT	Massachusetts Institute of Technology
NASA	National Aeronautics and Space Administration
NAVY	Department of the Navy
NOAA	National Oceanic and Atmospheric Administration
NRC	Nuclear Regulatory Commission
NSF	National Science Foundation
NYSDH	New York State Department of Health
OSU	Oregon State University
RIU	University of Rhode Island
RSKERL	Robert S. Kerr Environmental Research Laboratory
RU	Rockefeller University

SCEC	Southern California Edison Company
SRI	Stanford Research Institute
TAMU	Texas A&M University
TTU	Texas Tech University
TU	University of Texas
TVA	Tennessee Valley Authority
UCB	University of California, Berkeley
USC	University of Southern California
USDA	Department of Agriculture
USDA/CSRS	Cooperative State Research Service
USDA/FS	Forest Service
USU	Utah State University
WHOI	Woods Hole Oceanographic Institute

FUNDING AGENCY ABBREVIATIONS

Agency A

DOC	Department of Commerce
DOC/NBS	National Bureau of Standards
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
DOI/BLM	Bureau of Land Management
DOI/FWS	Fish and Wildlife Service
DOI/USGS	U.S. Geological Survey
DOL	Department of Labor
DOT	Department of Transportation
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
FEA	Federal Energy Administration
FHA	Federal Housing Association
HEW	Department of Health, Education, and Welfare
HEW/NCI	National Cancer Institute
HEW/NIEHS	National Institute of Environmental Health Sciences
HEW/NIH	National Institutes of Health
HEW/NIOSH	National Institute for Occupational Safety and Health
NASA	National Aeronautics and Space Administration
NOAA	National Oceanographic and Atmospheric Administration

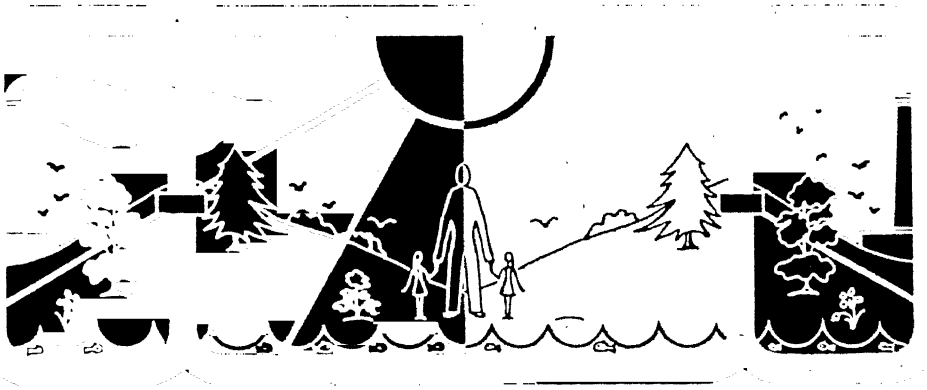
NRC	Nuclear Regulatory Commission
NSF	National Science Foundation
NYDH	New York Department of Health
TVA	Tennessee Valley Authority
USAF	U.S. Air Force
USCG	U.S. Coast Guard
USDA	Department of Agriculture

Agency B

AGA	American Gas Association
CSMRI	Colorado School of Mines Research Institute
DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
DOI/BLM	Bureau of Land Management
DOI/FWS	Fish and Wildlife Service
DOT	Department of Transportation
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
INCO	International Nickel Company
NOAA	National Oceanographic and Atmospheric Administration
NRC	Nuclear Regulatory Commission
NSF	National Science Foundation
OGA	Other government agencies
SWF	Southwest Foundation for Research and Education
TVA	Tennessee Valley Authority
USN	U.S. Navy

Agency C

DOE	Department of Energy
DOI/FWS	Department of the Interior/Fish and Wildlife Service
EPA	U.S. Environmental Protection Agency
EPA/USCG	U.S. Environmental Protection Agency/U.S. Coast Guard
NOAA	Department of Commerce/National Oceanographic and Atmospheric Administration



APPENDIX D

LOG AGENCIES

Log agency	Federal Inventory log number range
Department of Agriculture (USDA)	000001-010000
Department of Commerce (DOC)	010001-020000
General	010001-011000
Assistant Secretary for Environmental Affairs (DOC/ASEA)	011001-012000
National Bureau of Standards (DOC/NBS)	012001-013000
National Oceanic and Atmospheric Administration (DOC/NOAA)	013001-014000
Old West Regional Action Planning Commission (DOC/OWRA)	014001-014100
Department of Defense (DOD)	020001-030000
Department of Health, Education, and Welfare (HEW)	030001-040000
General	030001-031000
Assistant Secretary for Health (HEW/ASH)	031001-032000
National Institute for Occupational Safety and Health (HEW/NIOSH)	032001-033000
National Institute of Environmental Health Sciences (HEW/NIEHS)	033001-034000
Office of Associate Director for Genetics (HEW/NIEHS/ADG)	033301-033310
Biometry Branch (HEW/NIEHS/BB)	033311-033330
Environmental Biology and Chemistry Branch (HEW/NIEHS/EBC)	033331-033350
Office of Health Hazards Assessment (HEW/NIEHS/HHA)	033351-033360
Laboratory of Biochemical Genetics (HEW/NIEHS/LBG)	033361-033380
Laboratory of Behavioral and Neurological Toxicology (HEW/NIEHS/LBNT)	033381-033400
Laboratory of Environmental Biophysics (HEW/NIEHS/LEB)	033401-033420
Laboratory of Environmental Mutagenesis (HEW/NIEHS/LEM)	033421-033470
Laboratory of Environmental Toxicology (HEW/NIEHS/LET)	033471-033500
Laboratory of Pharmacology (HEW/NIEHS/LP)	033501-033520
Laboratory of Pulmonary and Functional Toxicology (HEW/NIEHS/LPFT)	033521-033540
Laboratory of Pharmacokinetics (HEW/NIEHS/LPK)	033541-033550
Extramural Program — R01ES Series (HEW/NIEHS/R01ES)	033601-033800
Extramural Program — 1 R01ES Series (HEW/NIEHS/1R01ES)	033801-033900
Extramural Program — P01ES Series (HEW/NIEHS/P01ES)	033901-033910
Extramural Program — R23ES Series (HEW/NIEHS/R23ES)	033911-033920
National Cancer Institute (HEW/NCI)	034001-035000
National Institute of Dental Research (HEW/NDR)	035001-035100
National Institute of General Medical Sciences (HEW/NGMS)	035101-035200

Log agency	Federal Inventory log number range
Division of Research Resources (HEW/NIH)	035201-035300
National Institute of Neurological and Communicative Disease and Stroke (HEW/NNCDS)	035301-035400
National Institute of Child Health and Human Development (HEW/NCHHD)	035401-035450
National Heart, Lung, and Blood Institute (HEW/NHLB)	035451-035550
National Institute on Aging (HEW/NIA)	035551-035600
National Institute of Arthritis, Metabolism, and Digestive Diseases (HEW/NAMDD)	034601-035700
Federal Drug Administration (HEW/FDA)	036000-036100
Department of Housing and Urban Development (HUD)	040001-050000
Department of the Interior (DOI)	050001-060000
General	050001-051000
Fish and Wildlife Service (DOI/FWS)	051001-052000
Bureau of Reclamation (DOI/BR)	052001-052500
Bureau of Mines (DOI/BM)	052501-053000
Bureau of Land Management (DOI/BLM)	053001-054000
U.S. Geological Survey (DOI/USGS)	054001-055000
Bonneville Power Administration (DOI/BPA)	055001-060000
Department of Transportation (DOT)	060001-070000
General	060001-061000
Assistant Secretary for Environment, Safety, and Consumer Affairs (DOT/ASESC)	061001-062000
Federal Aviation Administration (DOT/FAA)	062001-063000
Federal Highway Administration (DOT/FHA)	063001-064000
Federal Railroad Administration (DOT/FRA)	064001-065000
National Transportation Safety Board (DOT/NTSB)	065001-066000
Urban Mass Transit Administration (DOT/UMTA)	066001-067000
National Highway Transportation Safety Administration (DOT/NHTSA)	067001-068000
U.S. Environmental Protection Agency (EPA)	070001-080000
General	070001-070500
A. Environmental Monitoring and Support Laboratory, Cincinnati (EPA/A)	070501-070700
B. Industrial Environmental Research Laboratory, Cincinnati (EPA/B)	070701-070900
C. Municipal Environmental Research Laboratory, Cincinnati (EPA/C)	070901-071000

Log agency	Federal Inventory log number range
D. Health Effects Research Laboratory, Cincinnati (EPA/D)	071001-071200
E. Environmental Monitoring and Support Laboratory, Research Triangle Park (EPA/E)	071201-071300
F. Industrial Environmental Research Laboratory, Research Triangle Park (EPA/F)	071301-071700
G. Environmental Sciences Research Laboratory, Research Triangle Park (EPA/G)	071701-072000, 078001-078200
H. Health Effects Research Laboratory, Research Triangle Park (EPA/H)	072001-072300
J. Environmental Monitoring and Support Laboratory, Las Vegas (EPA/J)	072301-072500
K. Environmental Research Laboratory, Athens (EPA/K)	072501-072600
L. Environmental Research Laboratory, Ada (EPA/L)	072601-072700
M. Environmental Research Laboratory, Corvalis (EPA/M)	072701-072900
N. Environmental Research Laboratory, Duluth (EPA/N)	072901-073000
P. Environmental Research Laboratory, Narragansett (EPA/P)	073001-073100
Q. Environmental Research Laboratory, Gulf Breeze (EPA/Q)	073101-073200
R. (EPA/R)	073201-073250
S. (EPA/S)	073251-073300
T. (EPA/T)	073301-073350
U. (EPA/U)	073351-073400
V. Deputy Assistant Secretary for Energy (EPA/V)	075901-076100
W. Office of Air, Land, and Water Use (EPA/W)	079101-079200
X. Deputy Assistant Secretary for Health (EPA/X)	074001-074100
Z. Support Office, Research Triangle Park (EPA/Z)	074101-074200
EPA Region I — Boston (EPAI)	076101-076200
EPA Region II — New York (EPAII)	076201-076300
EPA Region III — Philadelphia (EPAIII)	076301-076400
EPA Region IV — Atlanta (EPAIV)	076401-076500
EPA Region V — Chicago (EPAV)	076501-076600
EPA Region VI — Dallas (EPAVI)	076601-076700
EPA Region VII — Kansas City (EPAVII)	076701-076800
EPA Region VIII — Denver (EPAVIII)	076801-076900
EPA Region IX — San Francisco (EPAIX)	076901-077000
EPA Region X — Seattle (EPAX)	077001-077101

Log agency	Federal Inventory log number range
Department of Energy (DOE)	080001-110000
Assistant Secretary for Environment (DOE/ASEV)	080001-093000
Argonne National Laboratory (DOE/ANL)	080001-081000
Brookhaven National Laboratory (DOE/BNL)	081001-082000
Lawrence Berkeley Laboratory (DOE/LBL)	082001-083000
Lawrence Livermore Laboratory (DOE/LLL)	083001-084000
Los Alamos Scientific Laboratory (DOE/LASL)	084001-085000
Oak Ridge National Laboratory (DOE/ORNL)	085001-086000
Pacific Northwest Laboratory (DOE/PNL)	086001-087000
Albuquerque Operations Office (DOE/AO)	087001-087500
Chicago Operations Office (DOE/CO)	087501-088000
Idaho Operations Office (DOE/IO)	088001-088500
Nevada Operations Office (DOE/NO)	088501-089000
Oak Ridge Operations Office (DOE/ORO)	089001-089500
Richland Operations Office (DOE/RO)	089501-090000
San Francisco Operations Office (DOE/SFO)	090001-090500
Savannah River Operations Office (DOE/SRO)	090501-091000
DOE Headquarters (DOE/H)	091001-092000, 092501-093000
Grand Junction Operations Office (DOE/GJO)	092001-092500
Assistant Administrator, Fossil Energy (DOE/FE)	093001-093100
Assistant Secretary for Resource Applications (DOE/RA)	093101-094000, 100001-100100
Assistant Administrator, Solar, Geothermal, and Advanced Systems (DOE/SGE)	094001-094100
Director of the Office of Energy Research (DOE/ER)	094101-095000
Assistant Administrator, Nuclear Energy (DOE/NE)	095001-095100
Assistant Secretary for Energy Technology (DOE/ET)	095101-096000
Assistant Administrator, Conservation (DOE/C)	096001-096020
Assistant Secretary for Conservation and Solar Application (DOE/CSA)	096021-096100, 096101-097000
Assistant Administrator, Planning and Analysis (DOE/PA)	097001-097100
Assistant Secretary for Policy and Evaluation (DOE/PE)	097101-097500
Assistant Secretary for Defense Programs (DOE/DP)	097501-097550

Log agency	Federal Inventory log number range
Administrator of Energy Information Administration (DOE/EIA)	097551-097600
Assistant Secretary for International Affairs (DOE/IA)	097601-097650
Assistant Secretary for Intergovernmental and Institutional Relations (DOE/IIR)	097651-097700
EPA "Pass Thru" to DOE (Assistant Secretary for Environment) (DOE/EPA Pass Thru)	098001-099000
Federal Energy Administration (FEA)	100000-110000
National Science Foundation (NSF)	110001-120000
National Science Foundation/Research Applied to National Needs (NSF/RANN)	111000-112000
National Aeronautics and Space Administration (NASA)	120001-130000
Tennessee Valley Authority (TVA)	130001-140000
U.S. Coast Guard (USCG)	140001-150000
Nuclear Regulatory Commission (NRC)	150001-160000

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